U.S. vs. IBM: Out of Court

● Justice Missing the Mark?

By Nancy French
And Edith Holmes
Of the CW Staff

NEW YORK – "You think he's going for the jugular, and he ends up merely shaking [the witness] by the shoulders."

That's the way a courtroom observer recently described a Justice Department attorney questioning a witness at the government's antitrust trial against IBM here.

An attorney himself, the observer suggested one reason why the government sometimes fails to make its point when questioning a witness about a situation with which he is thought to be familiar.

He called attention to the government's practice of allowing the attorney who is questioning the witness to accept questions on scraps of paper from its economic consultant, Alan McAdams, and pose them directly to the witness without a break in the proceedings.

Most of these questions get a bad response from the person on the stand because the examining attorney doesn't know what the witness

(Continued on Page 5)

● Witness Ponders Purpose

By Nancy French
Of the CW Staff

NEW YORK – "I know where Xerox fits into the hypothesis of the government's case against IBM, but I don't know that the questions I'm being asked would ever prove it. It's a case of ultimate subtlety," Rigdon Currie observed over lunch here recently.

Involved with sales and marketing for Scientific Data Systems, both before and after its acquisition by Xerox Corp., Currie is now Xerox's director of special businesses.

As a witness for the government in its antitrust case against IBM, Currie spent seven days on the stand "building the record," he surmised (see related story on Page 45).

"At some point in the future, I guess they'll put this all together and come to some conclusion, but it's hard to see what that will be right now," he added.

Currie has no opinion as to who should win this case, nor is he interested in getting into personalities or matters that might affect

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NEWSPAPER

SSA Charged With Hoarding Unneeded 370s

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – The Social Security Administration (SSA) contracted for $11.3 million in computer systems it has "no space for," "no electrical power for" and "no need for," a congressional critic charged here recently.

Rep. Charles A. Vanik (D-Ohio) attacked SSA for rushing a bid last June on four IBM 370/168 computers, long before the agency had anywhere to put them to use. They have been stored in a warehouse since January.

On the heels of these charges, SSA Commissioner James B. Cardwell appeared on Capitol Hill requesting an appropriation of $400 million more for SSA's six-year advanced systems planning project. The project is scheduled for completion in 1981 and includes new technology, procedures and computer hardware to make its vast payments systems "more responsive" to the public.

Four Machines Involved

Vanik made his remarks in testimony before the Labor and Health, Education and Welfare Department Appropriations Subcommittee of the House Appropriations Committee.

Vanik, who chairs the House Ways and Means Committee's oversight subcommittee, claimed the $11.3 million expenditure was for two IBM 370/168s which were purchased by SSA and two more financed under the General Services Administration's (GSA) revolving fund, which will be leased by SSA for $65,000/mo.

The DP procurement was rushed through just two weeks before the GSA's 1975 schedule contract with IBM was to expire, Vanik said.

The total value of the contract is $23 million, rather than $11.3 million, according to an SSA spokesman. Half is coming from the GSA and the other half from SSA.

SSA claimed the bid was let in June to take advantage of the 8% discount IBM had offered to government agencies in 1975. That discount was due to expire June 30, the end of the fiscal year.

And, because IBM missed the deadline for submitting its price list for the 1976 GSA schedule

(Continued on Page 6)

Trial Papers Indicate IBM Bundled to 'Beat' Rivals

By Edith Holmes
Of the CW Staff

NEW YORK – IBM had decided by 1965 that its strategy would be to "beat" competition with services bundled into its hardware prices rather than "meet" competition by lowering its equipment prices and charging separately for programming, education and maintenance support, documents and depositions presented to the court hearing the U.S. vs. IBM antitrust case here last week indicated.

In that year, the corporation determined unbundling was out of the question, internal IBM memoranda and reports and the deposition testimony of IBM executives entered into evidence by the government suggested.

By 1967, however, there was a growing realization that IBM would eventually be forced by market and government pressures to price its products separately. And early in 1969, the corporation had developed pricing methodologies that permitted its announcement of the unbundling of services from hardware prices on June 23, 1969.

For the time being, the Justice Department has left the market definition portion of its case against IBM and is pursuing the computer manufacturer's conduct in the marketplace.

The government has begun to describe IBM's practice of bun-

(Continued on Page 4)

Burroughs B730 Provides Direct Data Entry, MOS

By Esther Surden
Of the CW Staff

DETROIT – The B730 series from Burroughs Corp. offers small business system users direct data entry capabilities with concurrent program execution and MOS memory, features not previously found in the firm's B700 family.

The B730 is based on the established B700 processor, but incorporates a 60 char./sec console printer and MOS memory instead of core. These features preclude upgrades from current B700 systems to the B730 models, a spokesman noted.

But B730 systems are code-compatible with previous B700 systems, so users can move Business Management Systems application programs from one system to another, he added.

Up to four B9347-2 Direct Data Entry Stations can be attached to the B730. The stations feature the firm's Self-Scan display panel and an operator-oriented keyboard, the spokesman said.

The stations utilize Audit Entry Language (AEL), also introduced with the B730. AEL requires a minimum of user training and can be compiled on the B730 systems, Burroughs said.

The B730's operating system, System Control Program II, allows up to four operators sitting at the data entry stations to enter data under the control of

(Continued on Page 2)

Soliciting Users' Comments

Ansi Publishes Basic, Fortran Standards

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. – Proposed standards for two programming languages – Basic and Fortran – have recently been published by the American National Standards Institute (Ansi).

Public comments on each will be accepted until early July, according to Robert Brown, secretary of Ansi's X3 committee on information processing.

Basic has not been through the standardization process before. The proposed standard was the direct result of a suggestion made nearly five years ago by Prof. J.A.N. Lee, then of the University of Massachusetts, who argued that without the formality of standardization, the language would become so "enhanced" it would lose its usefulness as a teaching tool.

Fortran was first standardized about 10 years ago. The current proposal was designed to bring that standard up-to-date and to clarify some of the ambiguities that existed in the old documentation, Brown said.

Copies of the Fortran draft are available from the Association for Computing Machinery (ACM), which published it for Ansi as a newsletter to the members of ACM's Special Interest Group on Programming Languages.

Basic was developed by professors John Kemeny and Thomas Kurtz of Dartmouth College as a vehicle by which students there could communicate easily with a computer. Kemeny is now president of the college. Kurtz, head of Kiewit Computation Center at Dartmouth, chaired the Ansi X3 technical committee

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Fears Contradictory Overlaps

Adapso Wants Uniform Privacy Law

By Don Leavitt
Of the CW Staff

ATLANTA – The major goal for the Association of Data Processing Service Organizations (Adapso) and its members is Federal preemption of the entire area of privacy and security, according to Stephen H. Beach, general counsel for the Service Bureau Co.

"The proliferation of legislation, enacted and pending, contradictory and overlapping" makes it appear "each jurisdiction [is] afraid that if it fails to enact legislation promptly, however unrealistic, unworkable and costly, it may be criticized by its own electorate," he told the association's 44th Management Conference last week.

Reporting on the start-up activities of Adapso's Committee on Privacy and Security, he hoped that "at least the enforcement" of newly enacted legislation by the various states "will be postponed until the completion of two-year studies," now under way by the Privacy Protection Study Commission.

Adapso's committee includes representatives from 16 member companies, and the work it has defined for itself has been divided among three subcommittees.

Uniformity Vital

But the one thing that is important – "indeed vital to our industry" – is uniformity among whatever regulations may finally emerge, Beach said. "Virtually all" of Adapso's members are engaged in interstate commerce, he added.

Realistically "we could not possibly tolerate state laws that would prohibit the transmittal of personal data on individual citizens beyond the borders of the state where such citizens reside," he remarked.

The cost of establishing data centers in each state "would be totally prohibitive," he added.

The feasibility of privacy and security requirements combined with the cost of compliance is the second greatest concern of the Adapso committee, according to Beach. While privacy is an issue that involves far more than the DP industry, "the costs associated with the resolution of that issue do concern our industry," he said.

Security, on the other hand, "is our responsibility. We owe our customers and the public reasonable security of data. . . commensurate with the cost of providing that security," the attorney said. "Fail-safe" security is "certainly out of the question from a cost-benefit standpoint," he added.

The association's committee intends to develop tentative security standards for all data centers, Beach said, and these will be "both reasonable and not cost-prohibitive."

If properly presented to public officials, these standards "may very well prevent the adoption of [other security standards] which may be harsh, unreasonably restrictive and costly."

Adapso's committee has not yet established a timetable for completion of its proposed set of standards, he said. However, he and others who are particularly interested in the project will periodically prod the committee membership if there seems to be too little progress being made, he added.

Burroughs Brings Out MOS B730

(Continued from Page 1)

four different programs while the system is concurrently executing a batch program in the background, the vendor claimed.

The system can be compared to the IBM System 32 or the lower end of the IBM 3 line, the spokesman said.

With the inclusion of MOS, memory can range from 32K to 80K bytes. Previously, 48K bytes was the maximum core available for the B700 systems, he said.

A variety of peripherals and subsystems are available for the B730 including disk file subsystems, line printers, CRTs, magnetic tape cassette stations, magnetic tape drives and industry-compatible floppy disk drives.

The B730s can accept data prepared on Burroughs' Audit Entry Data Preparation Systems, the spokesman said.

Standard systems for first-time users as well as advanced configurations are available. Prices range from $34,900 to $150,000, Burroughs said.

A B730 with 32K of MOS memory, 60 char./sec console printer, 4.6M bytes of disk and an 85 line/min printer costs $34,900 and leases for $947/mo, Burroughs said.

An intermediate package that includes one Direct Data Entry Station costs $45,900 and leases for $1,245/month. That package includes the processor with 48K of memory, 4.6M bytes of disk, 60 char./sec console and 160 line/min printer.

AEL software and the operating system are included in the purchase price, Burroughs noted.

Users can add up to four data entry stations at $4,990 or $125/month each, Burroughs said. The data entry stations will be available by the third quarter while the B730 series can be ordered immediately, the vendor said from Detroit, Mich. 48232.

Privacy Group Relocates Hearings on Bank Practices

WASHINGTON, D.C. – The Privacy Protection Study Commission has changed the location of its public hearings on the recordkeeping practices of depository and lending institutions.

Instead of Washington, D.C., as originally announced [CW, March 22], the hearings will be held in New York City on April 21 and 22 from 10 a.m. to 5:30 p.m.

A day earlier, on April 20, the commission will hold an open business meeting from 10 a.m. to 5:30 p.m.

Both the meeting and the hearings will be held in Room 305 of the Federal Building, 26 Federal Plaza, in Foley Square.

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PSYCHED

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Please understand that this is no reflection on those salesmen themselves — all of whom are fine upstanding types. In fact, we respect them so much for what they're doing for us — at no cost whatsoever — that we'd like to start a nationwide campaign: "Take an IBM sort salesman out to lunch!"

The trouble — for them anyway — is that their sorts just can't compete with SyncSort III-and-half. And this fact is beginning to seep down into a few souls over there in Hardwareland.

If you don't believe it, try this simple little experiment. The next time your IBM rep appears, shake his hand and make him comfy. Then ask him, casually, if he'd be interested in testing his PEER/ICEMAN package against our SyncSort III-and-half. You'll use your file characteristics, and you'll be the impartial arbiter of which does a sort job better.

Well! — as Jack Benny used to say. You may be overwhelmed by his lack of enthusiasm for your proposal. In fact, your guest may look at his watch and suddenly recall that he has another pressing engagement — elsewhere. *Anywhere.*

The poor chap is suffering from one of the great dilemmas of our time. He is a *software* salesman working for a *hardware* company. His product is always going to ride in the backseat. And after a bit that can unsettle any salesperson.

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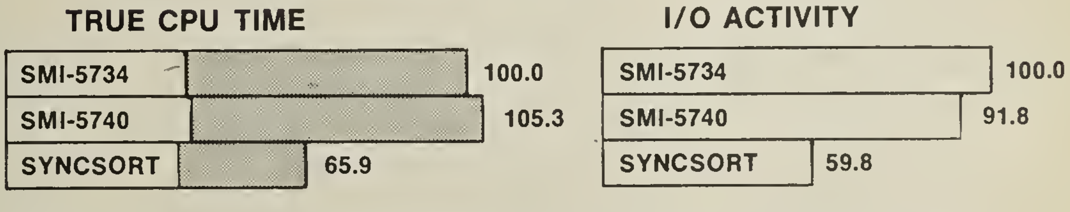

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They also know that SyncSort is a great *people-saver.* It makes machines work harder and people work easier. And we think that's the way it ought to be.

So the next time a sort salesman comes to call, welcome him. It doesn't make any difference whether he's from Whitlow or IBM. Either way he'll probably steer you to SyncSort eventually. And that'll be all to the good. Because it will take most of the headaches out of a very *headachey* job — sorting.

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SERVICE

Court Told IBM Bundled to 'Beat' Rivals

(Continued from Page 1)

dling its prices and, in the course of the next several weeks, will present 190 documents from the corporation's files, read portions of 16 depositions of IBM executives and examine five witnesses on the subject.

Services were the key to IBM pricing and IBM success in the marketplace, according to several 1965 documents. The "extras" IBM offered with its hardware were intended to offset any price/performance advantage gained by a competitor and to give that competitor something to think about providing in order to compete successfully against IBM.

Far better than price cutting, this marketing approach permitted IBM's gross revenues to stay where they were and improved the entire industry by helping the customer do more as well, an internal memo stated.

Advised Against Unbundling

In the meantime, however, IBM management wasn't ignoring the unbundling issue. J.P. Maurer, manager of corporate pricing at IBM's corporate headquarters from 1966 until his deposition was taken in connection with the Control Data Corp. and Greyhound Corp. litigation against IBM in 1971, said he was assigned in late 1965 to report his views on whether IBM should unbundle.

Not the only person in IBM asked for such views, Maurer produced a 29-page report dealing with the potential effects of unbundling. He said in his deposition the study was prompted by congressional committee hearings on how the government should handle its DP procurement, a growing realization that DP was maturing and that all users didn't require extra services and an understanding that services like education could be acquired from an outside vendor.

"The single combined price for hardware and whatever degree of service an individual customer may require to achieve a successful installation has been one of our greatest competitive advantages," Maurer wrote in his report.

"To be successful, a competitor must overcome the combined strength of our entire offering rather than individual segments which, standing alone, might be more vulnerable."

If IBM unbundled its prices, he predicted a variety of results including lower hardware prices, which in turn would make entry into the used equipment business easier. The only element of the system being sold would then be a tangible piece or pieces of hardware, he stated. Similarly, IBM trade-in values would be easier to establish.

In general, Maurer felt IBM would lose business in an unbundled situation because the overall price of the system would be higher.

At the same time, the establishment of separate service businesses could contribute to the overall growth of the corporation.

At his deposition, Maurer said he was not sure in 1965 whether IBM faced competition in support services, although he predicted at the time that unbundling would cause the number of hardware and software competitors to increase.

"IBM wanted to be cautious in its pricing actions to make certain it didn't come across in a predatory manner," he said, adding "if there were no competitors, IBM would have just as many worries."

By staying bundled, the corporation was in a better position to acquire new and small customers who would require a good deal more support. Unbundling would probably cause a drying up of technical knowhow to the disadvantage of all customers, he thought.

Furthermore, IBM salespeople would have had to diversify and dilute their efforts; it would have been a new experience for them to market specific services.

Maurer conjectured IBM would have to develop "controls to prevent the bootlegging of services" and would have to be sure to unbundle for rental and purchase customers alike so rental customers who later decided to purchase their machines would gain no advantage in the price paid for education.

Maurer had no further contact with unbundling studies after 1965, but there were others who encountered the subject both prior to and after that date. Among them was David M. Sturges, who held several positions in IBM related to pricing for various products – particularly those from the General Products and Data Products Divisions.

At the time of his deposition in 1972, Sturges was assistant to the vice-president of finance in the IBM World Trade Corp.

Sturges was involved in studies on unbundling in 1959, 1967, 1968 and 1969. Defining "bundled" as the pricing policy IBM followed prior to June 23, 1969, he said certain programs, particularly language processors and applications programs, certain advanced education and certain systems engineering services were unbundled that year.

Necessary Move

IBM's final study prior to the unbundling announcement, called "CS&M III" (the third study done for IBM's outside counsel, Cravath, Swaine and Moore), had determined that with the growing complexity of installing computer systems, the corporation could not continue to provide unique products for a single price, Sturges stated. Customer needs had become too varied for that.

There were also legal problems with continuing not to price separately, however, according to Sturges. He believed these problems were encountered in three areas: with customers who felt they weren't getting their fair share of IBM services; with customers who didn't want their fair share or to pay for it; and with competitors who were offering systems and parts of systems for separate prices.

IBM conducted studies of growth patterns of software and consultant industries, and these seemed to predict "a confrontation over the things IBM had in its bundle," Sturges said at his deposition.

At the time of the unbundling announcement, the move was said to enable IBM to better satisfy customer needs. If IBM charged for the program requests of customers, it could respond to these particular requests rather than merely give generalized advice on how a customer might proceed with a problem, Sturges said.

Witness Ponders His Seven Days

(Continued from Page 1)

current business or customers, he said.

Further, Xerox's position is one of "adamant neutrality," he added, so he did his best "to cooperate with both parties and bury any personal biases I may have."

Doing his best meant meeting a brutal schedule and putting notions of doing any other work out of his mind temporarily. Since he lives with his wife and two sons in Westport, Conn., Currie decided to commute to the trial each day rather than stay in a hotel here, as most other witnesses do.

This meant getting up at 6:30 a.m. to catch Conrail at 7:51. From Grand Central Station, the federal courthouse in Foley Square is a few express stops on the Lexington Ave. subway line. Currie's first meeting of the day was at 9:15 with the government team.

Currie said he tried to take a complete break from the trial for lunch and then went back on the stand for questions until 4 p.m.

Then it was more meetings – this time with IBM to prepare for the next day's testimony. These meetings sometimes took as little as half an hour and sometimes lasted until midnight, he recalled.

Most people don't realize that both sides prepare a witness for every question he will be asked on the stand, Currie explained. In this particular suit, IBM does better preparation for specific questions than the government, he said.

While both sides asked him an occasional question he hadn't heard before, IBM's surprises were minor. But some of the government's were "substantive," Currie said, and often were handed to government attorneys by economic consultant Alan McAdams during direct examination.

"Sometimes I felt the government was still doing discovery at those 9:30 meetings – the questions were so general," he said.

IBM attorneys, on the other hand, usually had very specific questions to ask – "they were going over the actual questions I would be asked."

Preparation Helped

Preparing answers ahead of time helped assure Currie didn't reveal anything he shouldn't have, he said.

"On the stand I was concentrating so hard on listening to the questions and then answering as precisely I could that I might have forgotten about protecting Xerox's current business interests," he said. "Even though my attorney was in the courtroom, I was going it alone."

Currie's dismissal from the witness stand brought to an end a commitment to this case that began "around Christmas time," he recalled.

"About that time, Justice Department lawyers and their staffs came to my office and interviewed me about the Xerox exit decision. Then they came again, but the second interview was more general – they wanted to get an idea of why we did what we did. Since then I've had lots of interviews with both sides."

Didn't Prepare Himself

Currie received his subpoena in February, but made a point not to do any preparation on his own, relying on his memory instead.

"I thought if I couldn't remember something, or I wasn't stimulated by a document either side might show me, the information being asked for probably wasn't relevant," he said.

While participation in this case has been extremely expensive and time-consuming for Xerox and its personnel, Currie refused to try to estimate any dollar amounts.

He did explain that "the Justice Department went through all my files – probably 50,000 pages of documents." Further, Xerox staff members "all the way up to C. Peter McColough [chairman of the Xerox board] have been involved in the case."

Besides that, "we have an outside counsel plus paralegals, plus travel expenses," he noted.

But Currie's time commitment was minimal compared to that of the people from the Justice Department and IBM who are working on the case, he said.

"I've been really impressed by the amount of time the lawyers and other people – secretaries, economists and financial people – are putting in on the case.

"The IBM team, for example, moves to White Plains on Thursday to continue working through the weekend after working all week in New York," he pointed out.

Billings Caused by DP Error

Utility Undercharge Collection Halted

By Catherine Arnst

Of the CW Staff

PITTSBURGH, Pa. – The Duquesne Light Co. here has been ordered by the state Public Utilities Commission (PUC) to hold off from collecting bills as high as $2,000 from district customers who were undercharged for the past nine years through a computer error.

The error was discovered when the company examined the records of a meter missing a seal. The multiplier on the meter used by the computer system to compute usage was lower than 12, the correct number.

The system was then audited and a total of 25 similar accounts turned up. Bills for back charges ranged from $200 to $2,000, area newspapers reported.

The company intended to collect on the undercharges made during the past six years, the period of time allowed by the statute of limitations dealing with back charges in Pennsylvania contract law.

But Helen O'Bannon, Southwest Pennsylvania's representative on the five-member PUC, issued a directive to "cease collection" until the commission decides what action is appropriate.

Duquesne has filed a petition with the PUC requesting that it be allowed to collect the back charges because such a collection is in accordance with the state contract laws, O'Bannon said. The PUC will hold hearings on this at the end of this month before making any final decision.

If the commission relies strictly on contract law, it will be faced with a discrepancy. An individual who has overpaid a bill can only collect retroactively for up to two years as opposed to the six years allowed for companies.

"That, to me, is unfair to the consumer," O'Bannon said. "Somewhere we've got to determine when the company is responsible."

Two Choices

The PUC may either determine to set up a ruling applying to this situation, which then could not be retroactively applied to Duquesne, or come up with some existing legal justification for putting a limit on how far back companies can collect, O'Bannon said.

"It's my feeling the customers will have to pay some of the amount, but I don't believe they should pay all of it. Where does the company's responsibility for good management start?" she asked.

At present, there are no regulations which require utilities auditing the operational aspects of their billing systems; only financial audits are required. O'Bannon does not want to pass such regulations in the future, either.

"I would hope that the way we would regulate operation is by limiting the period of time companies can collect on an error, which would force companies to regulate themselves by instituting better management," she said.

"We don't really want to get into the business of running the utilities."

Since the Duquesne billing errors have surfaced, "lots of others have been turned up," O'Bannon said. One example she cited was that of a man who had been undercharged by $2.50 every month on his phone bill for the past 10 years.

The companies involved in these errors have explained data input errors were made when changing over to a computerized system or when erroneous data was input to an already operational system.

Justice Missing Mark: Observer

(Continued from Page 1)

is going to say, the lawyer remarked, pointing out the witness hasn't been prepared for them.

He contrasted this procedure with that of the IBM attorneys. These lawyers never ask a question unless they know what the answer will be, aren't particularly concerned with what the answer is or have at least one document or other piece of evidence with which to confront the witness if he gives a "wrong" answer.

Before each day's testimony, lawyers from both sides have an opportunity to prepare the witness for the subject areas and the questions he will be asked that day. The observer, who provided legal counsel to a recent witness, noted this procedure serves several purposes.

First, after such a rehearsal, the witness can present his testimony without stumbling and searching for words, he explained. The witness also has a chance to formulate his answer without courtroom pressure.

Finally, these interviews help the witness guard against forgetting his own interests and inadvertently revealing information that might pertain to his current private business.

Preparing the witness also works to the examining attorney's advantage because it gives him the opportunity to abandon a question if, during preparation, he learns it won't produce the answer he needs to build his case.

Government at Disadvantage

Since the government is presenting its case at the moment, its lawyers are bound by rules of evidence that prevent asking witnesses "leading questions," the observing attorney noted. As a result, the attorney handling direct examination may have to ask the same question several different ways to get the exact answer he wants on the record, he said.

The defense attorneys have the advantage in this regard because, under the rules for cross-examination, they can "lead" the witness as much as the judge will permit, he continued.

They can suggest by the wording of the question the exact answer they want – even to the point of eliciting a "yes" or "no" response, he explained.

When IBM begins presenting its side of the case to the court, these tables will be turned, he added.

Other attorneys observing the proceedings of this trial have commented on the surprise with which some of the government attorneys greet the answers they receive from their own witnesses. But while the "element of surprise" is generally greatly reduced in an antitrust case – and particularly one in preparation for over six years – even lead IBM attorney Thomas D. Barr remarked, "You never can be absolutely sure of everything that's there."

Frustrated at times by press and public reception of the case as they have presented it so far, government attorneys have commented on what they call the "Perry Mason attitude" of people not trained in the law.

They suggest the public has been conditioned to believe the defense is always prepared and always right and the prosecuting attorney can never match that record.

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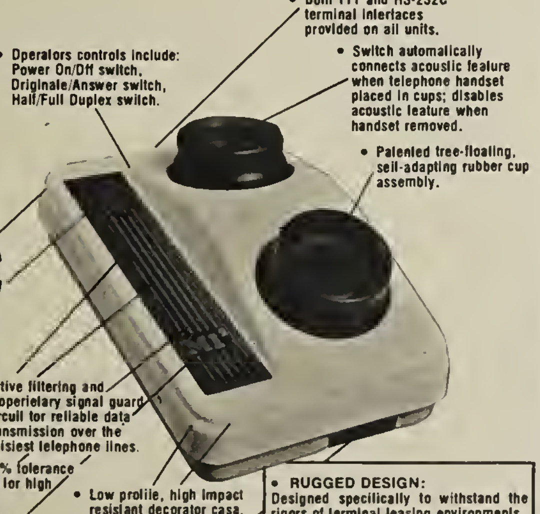

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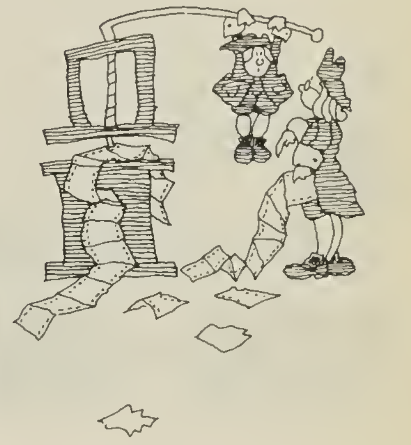

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SSA Hoarding Unneeded 370s Worth $11 Million: Vanik

(Continued from Page 1)

last February, the only way federal agencies can obtain new IBM equipment through October 1976 is by competitive bidding.

Industry critics believe SSA rushed the bid through so it could sole source from IBM at GSA schedule prices rather than invite competition.

While notice of the procurement was in the *Commerce Business Daily* in February, the request for proposals (RFP) was issued less than a month before the proposals were due.

Itel Corp., which asked for a 21-day extension of the bid deadline, was denied its request because of what SSA said was an urgent need for the equipment.

It now appears, however, that the equipment can't be installed at SSA until the new facility is completed – sometime in November 1976 – 14 months after the bids were requested.

Such procurement practices show a "total disregard for planning and efficient use of trust fund money," Vanik said.

According to a spokesman for SSA, the 168s were to have been installed in the computer room after it was remodeled. Then, SSA ran into a snag with Congress, which tied up its appropriation, delaying the remodeling work.

An IBM spokesman indicated that, although the systems are in a Baltimore warehouse, the storage isn't costing the government anything. "We often store equipment before installation as a convenience to our customers, but usually it's not this long," he said.

Ted Puckorius, commissioner of GSA's Automated Data and Telecommunications Service, said that, to date, no money has been spent under the purchase contracts.

The systems were obtained under IBM's "alternate purchase plan" under which four payments are made over a three-year period. Ownership will not pass to the government until the first payment is made.

Equipment acquisition is not SSA's only problem.

SSA's DP department has been plagued with overpayments associated with processing its Supplemental Security Income program [CW, Oct. 8, 1975].

SSA has increased its DP capacity 20 times between 1965 and 1974, and plans to more than double its present capacity by 1980, Vanik said.

But "SSA's traditional way to meet data processing needs is basically through the acquisition of additional computer hardware rather than questioning the level of utilization of its existing equipment and the quality of its programs," he said.

Others would agree, including an SSA computer programmer who filed a report to that effect earlier this year which said "present capacity more efficiently used is more than adequate to handle the SSA's computer requirements" [CW, Jan. 26].

Ansi Publishes Basic Standard

(Continued from Page 1)

(X3J2) that drafted the current proposal.

The draft standard is entitled "Minimal" Basic and "that is exactly what it is," Kurtz explained recently. One or more sets of enhancements may be proposed later, he said, but for now X3J2 wants to get general agreement on the elemental language.

"There was a strong need expressed by both some industry people and by the Federal government for getting out something pretty darn quickly on 'Minimal' Basic, or they were going to do it themselves." The National Bureau of Standards had actually contacted with Lee to come up with some standards, Kurtz said.

Basic Praise

DETROIT – Basic language users were quick to proclaim its virtues at a recent Computer Caravan session here on "Minicomputer Projections for the Near Future."

One attendee observed he moved from Fortran to Basic in a weekend. "It's a subset," he said.

Another said he can debug much faster in Basic than Cobol; several commented on the feature that gives instant feedback on whether the line of code is accepted.

Speaker Thomas E. Damman, a consultant with Price Waterhouse & Co., observed there should be a good supply of Basic users since many colleges are using this language.

He advised users to look for programs that are table-driven so file structures and formats on a CRT screen can be changed without reprogramming.

X3J2 moved quickly after that, he said, noting his group took Lee's standards "along with a couple of others" and put them together as the present proposal.

With that document published, the standardization group has now turned its attention to the enhancements in specific areas such as string-handling. Kurtz said, however, he does not now know how the enhancements will be "packaged" once they are defined.

Descriptive Value

The principle value of the standard is in terms of description, the ability it will provide implementors – and users – to know what level of Basic they have, the developer-standardizer remarked.

The minimal Basic standard is similar in form to the description of Algol 60, Kurtz said, but does contain some additional materials as well. Each chapter, for example, includes a "remarks" section so comments which seemed useful but not appropriate to either the syntax or the semantics discussions could be included.

The proposed standard is "fairly straightforward," in Kurtz's view. Each section has general comments on the statement to be covered, then syntax, examples, semantics, error conditions and finally remarks.

Each section ends with a discussion of "resolved questions." This is not really part of the standard, Kurtz contended, but is useful in showing how the X3J2 group reached its conclusions.

Copies of the proposed Basic standard are available from Brown at the Computers and Business Equipment Manufacturers Association (Cbema), 1828 L St. N.W., Washington, D.C. 20036.

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IBM Adds to 3600 System, Makes 3790 Enhancements

By John P. Hebert
Of the CW Staff

WHITE PLAINS, N.Y. – IBM has introduced additional hardware components for its 3600 finance system that include enhanced versions of the 3601 programmable controller, two communications controllers, financial transaction terminals, a document printer and a two-sided diskette file.

In addition, the company enhanced its 3790 remote processor system.

The programmable communications controllers, the IBM 3602 models 1A and 1B, have disk files containing 5.2M- and 9.3M characters of storage respectively, IBM said.

The controllers provide up to 56K characters of user-programmable storage and contain a removable diskette file that records data on both sides, providing an additional capacity of 560K characters.

Four 3601 Models

Enhanced versions of the 3601 programmable controller are the models 2A and 2B and 3A and 3B. The 2A and 2B provide up to 56K characters of user-programmable storage – an almost 17K-character increase over earlier models – and can handle three loops of terminals, IBM said.

The 3A and 3B provide the same amount of user-programmable storage as their Model 2 counterparts, but allow the handling of six loops of terminals.

The 2B and 3B incorporate the two-sided diskette file; the 2A and 3A use a one-sided removable diskette, which provides 280,000 characters of storage, IBM said.

A communications adapter, another addition to the IBM product line, was introduced as an optional feature for the 3602 and 3601 models 3A and 3B communications controllers.

The adapter is said to increase the maximum transmission rate between a controller and CPU from 4,800 bit/sec – the previous maximum speed to 9,600 bit/sec.

The 3601 and 3602 controllers can communicate with a host IBM mainframe using IBM's Synchronous Data Link Control (SDLC) line discipline, the company said.

Keyboard display teller terminals have also been added to the 3600 product line – the 3604 models 5 and 6.

The terminals display 120- and 240 characters respectively and either can be placed in front of a 3610 document printer, forming an 18-in. by 18-in. unit, IBM said.

A document printer has also been added. The 3610 Model 4 is a teller station printer which reportedly can provide a record of transactions on a continuous journal roll.

The 3602 models 1A and 1B communications controllers cost $34,300 and $37,300 respectively. The controller prices include a minimum user-programmable storage of 24K characters, IBM said.

The Model 3601-2A controller is priced at $15,200; the 3601-2B is priced at $17,200; and the 3601-3A and 3601-3B controllers cost $17,800 and $19,800 respectively, IBM said.

The IBM 3604 models 5 and 6 keyboard display terminals cost $1,575 and $1,825 respectively.

The 3610 Model 4 document printer is priced at $2,225, IBM said.

3790 Communications System

The enhancements offered for the 3790 communications system include IBM Customer Information Control System/Virtual Storage (CICS/VS) and Information Management System/VS (IMS/VS) program expansions.

In addition, data stream compatibility allows application programs previously written for the 3270 information display system running under CICS/VS or IMS/VS using mapping services to be used with "little or no modification" by attaching 3270 terminals to a 3790 system, IBM said.

The IBM 3284, 3286 and 3288 printers can also be attached to the 3790 system, the company said.

The 3790 system can operate under the Telecommunications Access Method (Tcam). It previously operated under the Virtual Telecommunications Access Method (Vtam).

The cost of a 3790 system including a 3791 controller with 7.8M characters of storage, a 410 line/min system printer and four 3277 terminals is $81,300.

First customer shipments of the enhanced 3790 are scheduled to begin in the first quarter of 1977, IBM said.

IBM also reduced rental and purchase prices on incremental storage features used in some communications controllers, including the 3650 retail store system, 3660 supermarket system and the 3770 and 3790 communications system.

A 3790 system was reduced in rental price from 1% to 7% and in purchase price from 2% to 17%. The new prices take effect immediately.

IBM Cuts Some 3600 Prices

WHITE PLAINS, N.Y. – Along with the addition of products for its 3600 finance system and its 3790 communications system, IBM reduced prices on several previously available 3600 products.

The price reductions range from 15% to 25% for teller terminals, document printers, passbook printers and document/passbook printers in the 3600 system.

The 3601 Model 1 controller, which will no longer be in production as of June 1 when deliveries on the enhanced 3601 controllers begin, has been reduced $2,208 or almost 9% to $17,800 from $20,140, IBM said, for a minimum version with 8K characters of storage.

In addition, IBM reduced prices 20% on the 3604 model 1 and 2 teller terminals from $2,120 to $1,695 and $2,385 to $1,910 respectively.

The 3604 models 3 and 4 have been reduced 15% each to $2,705 and $2,760 respectively.

The models 1, 2 and 3 of the 3610 document printer series now carry prices of $1,980, $2,165 and $2,545 respectively, down 15% to 20% from $2,330, $2,545 and $3,180.

The 3611 Model 1 passbook printer was reduced 20% from $3,040 to $2,430, and the 3611 Model 2 now costs $3,030, down from the previous $4,040.

The IBM 3612 document/passbook printers have been reduced 20%, with the Model 1 costing $2,885, Model 2 priced at $3,050 and the Model 3 costing $3,390.

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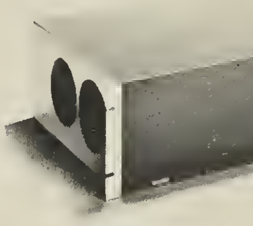

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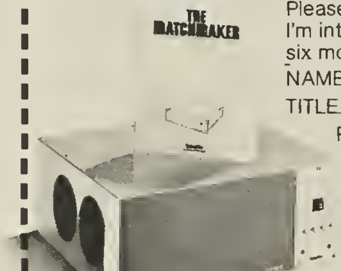

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DP Forecasts Knocked In Attempt to Halt Building of UK Road

Special to Computerworld

LONDON – Computer-generated traffic forecasts are at the center of a major controversy here because they are the biggest factor in deciding the need for a new motorway.

Critics of the motorway, equivalent to a U.S. interstate highway, have charged the forecasts were vastly inflated to justify the building of new roads that are not really needed.

The forecasts of car ownership and the distance each car will be driven between now and 2010 were made by John Turner of the government's Transport and Road Research Laboratory. Tanner, who has been using the method for 15 years, measures car ownership in cars per person (0.25 now in Britain and 0.48 in the U.S.), assuming this follows an S-curve – starting slowly, then rising rapidly and finally leveling off to a "saturation point."

The government treats the forecasts as "policy" which cannot be questioned at public inquiries on motorways. In October, the government issued confidential "notes of guidance" to the inspectors at these inquiries telling them not to permit questions on the methodology of the computer forecasts.

On Dec. 1, Dr. John Gilbert, transport minister, told the House of Commons he would not publish the notes for guidance and the government witnesses at inquiries would only "discuss the application of these forecasts."

Under Strong Attack

Tanner's car forecasting techniques have come under increasingly strong attack. The two most vociferous critics have been Mick Hamer of Friends of the Earth and John Adams of the University of London geography department.

Both have appeared at a number of recent inquiries, and it was their questions which prompted the notes of guidance to the inspectors running the inquiries.

Adams attacked the method on two grounds. First, he argued, there is no evidence car ownership does or should follow an S-curve. Secondly, he attacked the method of picking the saturation level.

But the core of Hamer's and Adams' protest is the use of this sort of computer model. Even if it were correct, they said, it is still just an extrapolation of the past.

Last year, the House of Commons Expenditure Committee (the British equivalent of the U.S. General Accounting Office) declared: "We recommend that the right to challenge the need for a transport scheme at a public inquiry should be firmly established. It should allow consideration . . . of the traffic forecasts which underline proposals."

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WANG

Holders Say CDP a Reliable Basis for Licensing

By Catherine Arnst
Of the CW Staff

HUDSON, Mass. – The Certificate in Data Processing (CDP) is a credential reliable enough to serve as a basis for licensing or other regulations, according to 81% of CDP holders questioned by the Society of Certified Data Processors (SCDP) recently.

SCDP, which first proposed the concept of licensing DP professionals [CW, Dec. 11, 1974] surveyed its 800 members with a ballot printed in its monthly newsletter and received about 100 responses.

There are 14,000 CDP holders in all, but Kenniston W. Lord Jr., president of SCDP, felt the survey sample was "enough of an evidence to show an interest in the subject."

Certificate holders should not be required to submit to requalification exams, according to 46% of the respondents, but 58% said they would submit to periodic exams on the state of the art.

About 64% would agree to obtain other certificates which might be necessary for performance of their job.

Responses supporting a "quality control" concept of DP included 58% who said performance evaluations similar to the certificate would be acceptable, and 72% would agree to minimum education requirements.

Only 36% of the respondents felt the exam should be made more difficult, while 58% thought it should be extended in size and content to more comprehensively test a candidate's knowlege.

Multilevel Certification

The concept of multilevel certification with the ultimate being a "capstone" certificate was embraced by 66% of the respondents.

Creation of uniform DP standards, supported by SCDP, was advocated by 61% of those surveyed.

The Institute for the Certification of Computer Professionals (ICCP) which presently administers the CDP exam, should become involved in the establishment of such standards, according to 83%. ICCP should also move forthrightly on the privacy issue, 66% of the respondents thought.

Responses to a question on what it was the CDP had certified its holders to do ranged from the "constructive" to the "abrasive." The first category included remarks such as "to process information by machine in a responsible way"; "to approve, design and organize data systems and operations"; and "to understand the responsibilities in production of a programming system."

The more negative comments included "to make a larger profit for the client"; "to walk on water. I believe the CDP exam qualifies its victor to be a director of management information systems. Maybe even to be Archbishop"; and "to babble the buzzwords."

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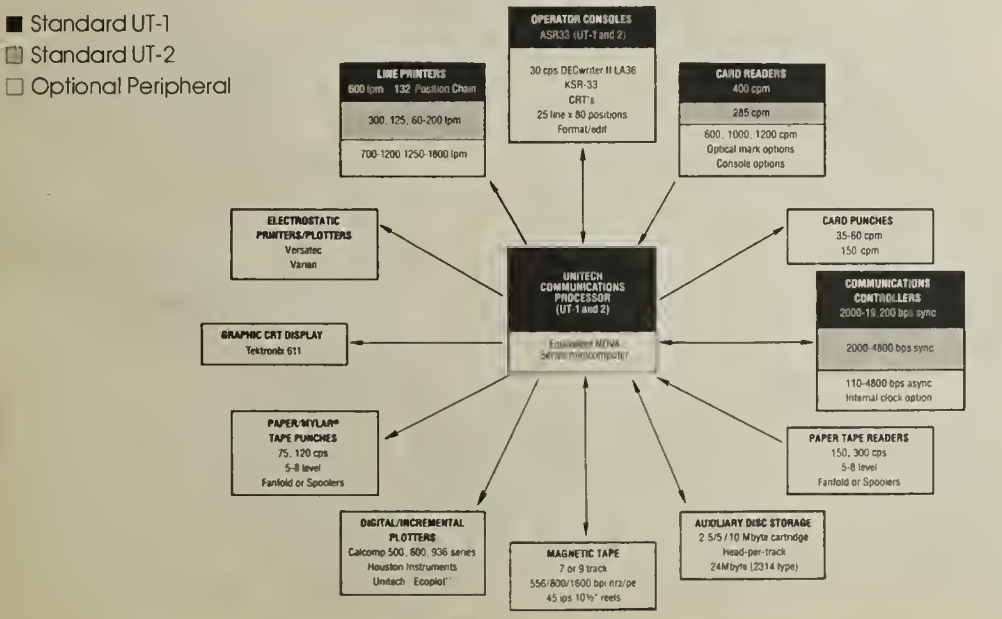

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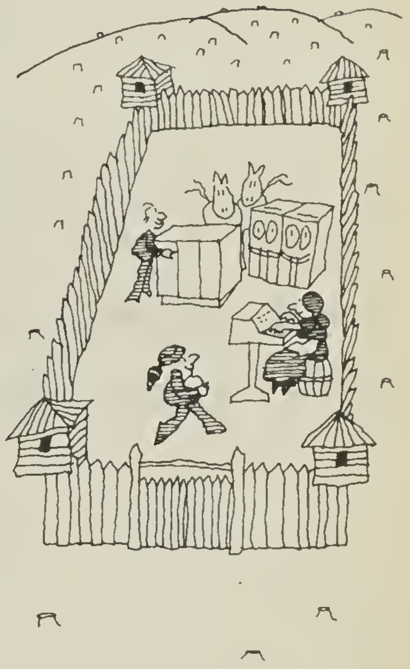

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Technology Seen Making POS Systems Viable

By Catherine Arnst
Of the CW Staff

WASHINGTON, D.C. – Technology has made point-of-sale (POS) systems a viable product, according to Marvin Krein, operating vice-president of management information systems for Abraham & Strauss (ACS).

However, he warned attendees at a conference sponsored here by Brandon Systems Institute, Inc. to avoid the mistake his company made of becoming "too infatuated with technology."

"We forgot about the $2.10 per hour sales clerks who are operating the terminals. Remember to design your system for the people who have to make them work," he said.

A&S installed POS systems in two of its 10 stores two years ago, using the Singer System Eight and 925 terminals. The store plans to go to POS in the rest of its stores over a two-year period once it makes the decision of what hardware to use now that Singer has left the market, Krein said.

"I'm very hepped up on terminals and POS and distributed computing," he said.

One of the main reasons for his enthusiasm is that "source-originated data acquisition (Soda) can eliminate many or possibly all DP problems concerning accuracy."

Before distributed computing most systems were operated on the premise of "keypunching data and letting it fall out along the way," Krein said, adding that error correction "just never seemed to get done.

"With Soda we can now validate every field before it enters the batch environment, and with POS we can get clean data into the processor," he said.

"POS terminals have been designed with a lot of logic," Krein continued. He gave as an example a TRW programmable POS terminal that is coming out which will have 16K of memory and a potential of up to 56K.

One advantage of terminals with logic is the machine's ability to do calculations for the store rather than having the clerk do it.

"With internal memory we can store tax charts in a system; some terminals can handle up to five different tax charts," he said.

The classic approach to POS is that the cash register is a terminal hard-wired to a minicomputer within the store, he said. The terminal usually contains some logic and is programmable to various degrees, and the minicomputer gives the user an interactive ability.

The minicomputer is used to collect data and relay it to a mainframe, he explained. "By going to a mini you can take large amounts of processing off the mainframe. The more on-line applications you have, the more you chew up CPU time," he said.

"The minicomputer allows you to preaudit and preedit data before it enters the mainframe," he said.

'Forced Compliance' Helpful

Krein suggested designing terminals which require "forced compliance" from the sales clerk. The clerk otherwise "will always find some way to do something wrong that no one had thought of," he warned.

"Use terminals that work only if they [the sales clerks] work," he said. "Make the terminal not work if the operation isn't done right. The clerk will discover the only way to finish with a customer is to operate the system correctly."

The minicomputer is also very important within a POS system, he said. "We didn't originally provide for all options of breakdown of hardware. Try and anticipate anything that might go wrong," he said.

A distinct advantage of POS is complete capture of the sales data in the minicomputer, but, if the minicomputer breaks down, this information is lost, Krein said.

A safeguard against this happening is an interim data collection device that captures data if the minicomputer goes down, he said. Redundant minicomputers are no good because "sometimes they both fail," he added.

Retailers use a method of keeping track of inventory according to the selling price rather than the price at which the merchandise was bought, Krein said as he described another advantage of POS. Stores must keep up with price markups and markdowns, and hopefully the inventory will equal the stock prices, he said.

POS systems are an ideal way of keeping an accurate accounting of these price changes, he said.

The major cause of shortage of inventory is either theft or bookkeeping errors, and the errors are much harder to track down than the theft, he said.

These errors can also be an expensive problem. "One store had losses in inventory shortage equaling 8.8% of their total sales, and a retail store only makes a 6% profit before taxes," he said. POS systems should cut down substantially on losses from bookkeeping errors, he said.

There has been some trend recently toward using POS for national credit cards, Krein said, "but retailers are dedicated to the idea of customer loyalty built up through store charges" and so are reluctant to go with national credit cards.

This is true in spite of the problem most retailers experience with store charge cards, he said. "There are tremendous losses; few companies make money on the service charge. The bad debts eat it up." Store charges are used primarily as a good-will service to build customer loyalty, he said.

Krein predicted a customer information system that could be developed with charge card information, however. Stores could analyze their POS records to see where charge customers regularly shop and then start direct-mail campaigns keyed to the individual customer's interests.

There is also no reason POS can't be integrated with bank services by using an electronic funds transfer system, "but traditions must break down first," Krein said.

Change Traumatic, Users Told

Need Should Dictate Move In-House

By John P. Hebert
Of the CW Staff

ATLANTA – "If a service bureau or time-sharing firm is doing the job you want done, don't change to another approach. Change is traumatic.

"However, if you need to change, do it as soon as possible," according to Joe Seidler of Technical Analysis Corp. at a workshop on "Small Organizations: Service Bureaus vs. In-House Computers" at the Computer Caravan here recently.

Seidler also advised attendees not to make decisions which are colored by emotions. "That's trouble," he said.

In addition, top management should be involved in any change from a service bureau to an on-line minicomputer system, for example, and top management should also make the decision to change in the first place, he continued.

The reason a firm opts for its own in-house computer system is because it has outgrown the service bureau which initially adequately performed its workload, Seidler said.

But if a good service bureau is chosen, then change won't be necessary, an attendee pointed out.

"But some people don't have computing experience, so they don't know which service bureau to choose" in the first place, Seidler said.

The basis for making a decision between a small computer system located in-house and the skill and experience of a service bureau "shouldn't be price it should be need," he emphasized.

"There is a good reason and a bad reason for switching to an in-house system: You must need it. It's not worth paying $1,800/mo for an in-house system when the service bureau is doing the work for $2,000/mo," because there are many more facets to owning your own computer than price, he told attendees.

Software, personnel and maintenance of that in-house system are important considerations, he said.

However, on the other side of the fence, "if the service bureau goes out of business, your application goes with it."

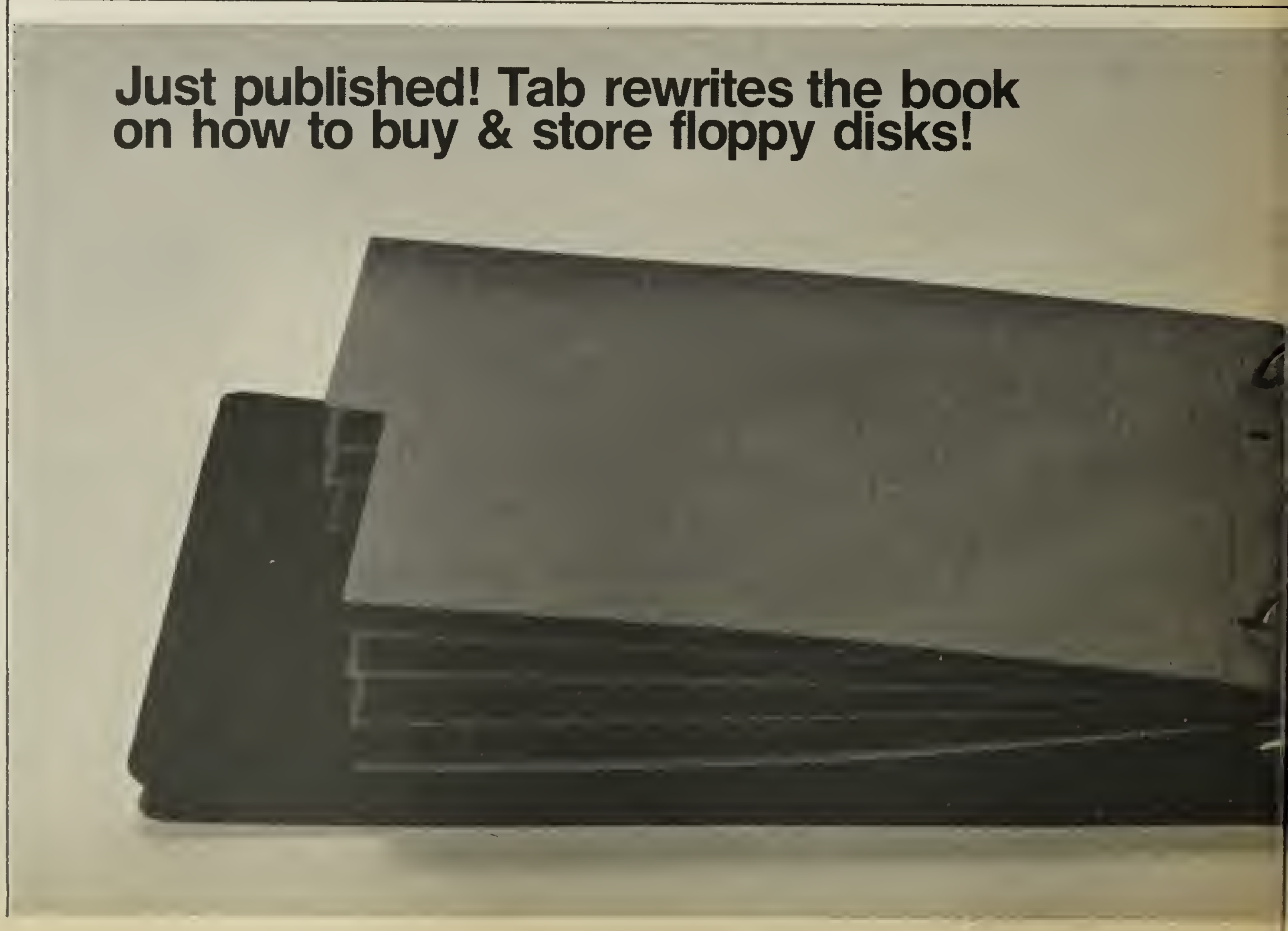
Puchase vs. Lease

"Purchasing is much less costly than leasing" a computer system or paying for the work to be done by an outside firm, if you really need the in-house capability, he noted.

Purchasing "is a very valid alternative. In the long run you save money because you have no equity to show with a leased computer, according to Seidler.

"If you purchase you sweat a bit more, but you eventually have more flexibility at a lower cost." However, the prospective minicomputer owner must be aware that designing and implementing from scratch is very costly and the overhead is much higher, he said.

If someone else is performing a similar application and it is working, "then I'd do it their way rather than develop from scratch."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Rate Increase Proposed

High Phone Bill Threatens Capitol's Traffic System

By Catherine Arnst
Of the CW Staff

WASHINGTON, D.C. – A $3.3 million computerized traffic system here may shut down in June because it's caught in the same crunch felt by many consumers – the city can't afford the phone bills.

The Chesapeake & Potomac Telephone Co.'s (C&P) rates for the 200 private data channels used by the system rose from $1,000/mo to $6,000/mo last year and a recently proposed increase will bring those rates to $21,000/mo.

"The first increase almost slipped by us. We didn't realize it would effect us so greatly," George Schoene, the traffic engineer in charge of the project, said.

The latest increase has not yet been approved, but the Public Service Commission (PSC) is supporting C&P's request, Schoene said.

"We've had experiences before with the PSC," he added. "The utilities usually win – you can postpone the increase, but that's about it."

The traffic system was designed and is managed by the Federal Highway Administration (FHWA) as a test project. It will be turned over to the city of Washington to operate in June, but the city does not have the funds to pay the proposed rate hikes, according to Schoene.

There are currently 200 signal lights tied into the system out of the 1,200 in the city. Cars are picked up by 500 roadway detectors which relay information via the data channels to two Xerox Sigma 5s by frequency division multiplexing.

The computer is programmed to regulate traffic flow by increasing or decreasing the amount of "green time" at a signal light, which is determined by the number of cars on the road and the direction they are traveling.

The communications system used was chosen because "it was reliable," Schoene said. "We weren't experimenting with communications systems."

Back to Old System?

The city is beginning a study of alternatives to the phone company, but the probability of a choice being made before June is slim, Schoene indicated.

The Capitol would then revert to its previous system of controlling traffic flow, which was already "extremely good," John MacGowan of the FHWA said.

More signals were centrally controlled with the old system and could be set to either morning rush hour, evening rush hour or off-peak sequences.

The system is 19 years old, however, and was manufactured by Motorola, which has since stopped making it. Consequently, no spare parts are available.

Repairs were also a problem with the old system. The traffic engineering department has no way of knowing when a signal breaks unless someone reports it; with the computerized system, a light in the control room flashes when a signal breaks, indicating where the trouble is located.

The computerized system improved traffic in the city by cutting driver time 5%, MacGowan claimed, saying that is more substantial than it sounds.

"That's not much to the individual, but you multiply that by a million drivers and you have considerable savings in fuel consumption and air pollution," he said.

In cities which do not already have some form of traffic control system similar to Washington's, MacGowan estimated savings in time could be as high as 20% per driver.

FHWA is very satisfied with the way the project turned out and the system is already being used in over 20 cities, MacGowan said. The Washington experiment has saved money for these cities by working out all the bugs – "The other cities have learned from our mistakes," Schoene said.

In the Capitol, however, the newest bug is how to make ends meet. "The system was all set to expand this year, but we thought it was foolish in view of the rising costs," Schoene said.

MacGowan claimed, however, that "the system is always cost-justifiable" in terms of the savings in driver time and traffic flow efficiency and added that if the city paid the $21,000/mo for 12 months (252,000), that amount would only equal 4% to 5% of its present total phone bill.

There is currently no way for the U.S. government to help the city pay its bills, because it cannot be involved in the maintenance and operation of the system once it is turned over to the city.

If Washington came up with a redesign, however, the city would be eligible for federal construction funds which might cover the phone line costs if the phone company is willing to quote those prices in the beginning, MacGowan said.

LEAA Thins Proposed Privacy Rules Governing Use of Criminal Justice Data

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Heeding the objections of local law enforcement officers voiced at hearings last fall, the Law Enforcement Assistance Administration (LEAA) watered down its draft privacy and security regulations and published the final version here recently.

The new version eases federal requirements in practically every sensitive area, turning over responsibility for setting fair information-handling standards to the state legislatures.

As originally published last May 20, the regulations required express state or local statutory authority in order to distribute conviction or nonconviction information for noncriminal justice purposes such as employment, licensing and news media access.

The new regulations place no restrictions on the distribution of conviction data or on criminal history information contained in court records of public judicial proceedings.

Allows Raw Data

Arrest information where prosecution is still pending as well as raw arrest records – arrests without dispositions – less than 90 days old could be disseminated under these rules.

However, as in the original version, states will continue to be forbidden to disseminate nonconviction data – raw arrest records that are more than a year old – unless it "is pursuant to or can be construed from the general requirement" of a state statute.

The regulations also give states another 90 days to establish procedures for detailing dissemination and security policies that assure records are "complete" and "accurate," for limiting dissemination of records and for setting general policies on use of data that is disseminated.

The original deadline for doing so was March 16.

Where computerized data processing is employed, effective and technologically advanced software and hardware design should be instituted to prevent unauthorized access to the regulations.

Computer operations, whether dedicated or shared, must assure the data cannot be modified, destroyed, accessed, changed, purged or overlaid in any fashion by noncriminal justice terminals.

The rules state further that destruction of records is limited to designated terminals under the direct control of the criminal justice agency responsible for creating or storing the record.

In addition, states are to use operating programs that detect and store for output all unauthorized attempts to penetrate any criminal history record information system, program or file.

The rules give criminal justice agencies the right to screen and reject for employment all personnel who will have direct access to criminal history information.

The agencies will also have the right to remove personnel in cases where they have violated the provisions of these regulations or other security requirements established for the collection, storage or dissemination of criminal history record information.

The regulations permit, upon satisfactory verification of identity, any individual to review "without undue burden to either the criminal justice agency or the individual," any criminal history record maintained about him and obtain a copy if necessary to correct the record.

The state must then provide for administrative review and correction of any record an individual claims is inaccurate or incomplete.

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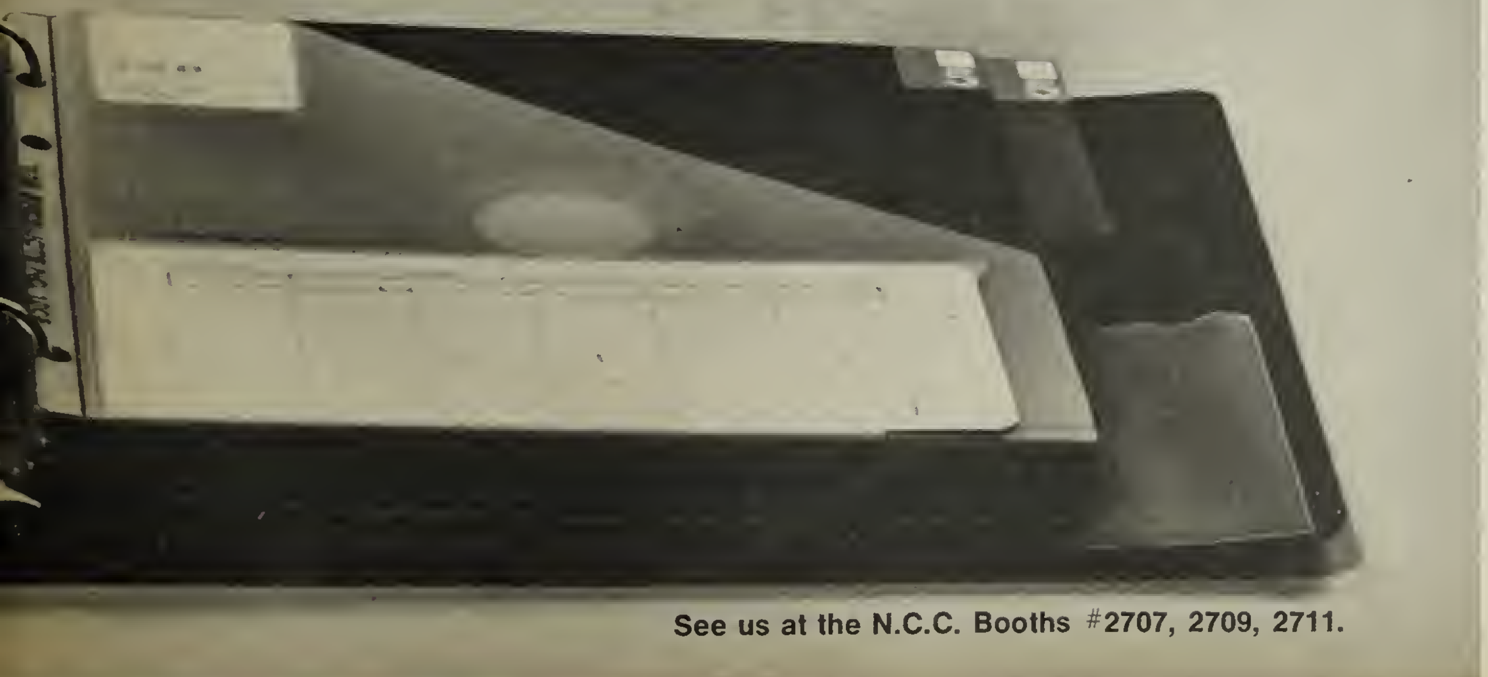

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Result of Punched-Card Switch

Court Orders Second Mayoral Vote in Two Precincts

By Catherine Arnst
Of the CW Staff

FLINT, Mich. – The Genessee circuit court has ordered that an election be rerun in only the two precincts involved in a punched-card switch during last November's mayoral election in this city [CW, March 1].

Only those voters who went to the polls in the previous election will be allowed to vote, and the judge has requested those 763 voters to vote the same way they did in November.

How Error Occurred

The error occurred in the original election when two of the nine ballot books of cards were accidentally switched in two Votomatic machines in neighboring precincts.

Since Michigan requires that candidate names be rotated on the ballot in each precinct, a vote cast on either of these machines for one candidate would be tallied as a vote for the other candidate.

The election was won by James Rutherford by a margin of 206 votes out of the 42,000 cast.

Suit Filed

Suit was brought before Circuit Judge Ollie B. Bivens Jr. in February against the city clerk of Flint by Floyd McCree, the losing candidate, and the League of Women Voters. Both plaintiffs requested that the entire election be rerun.

The Judge ordered March 19 that the election in the precincts be rerun April 13. Barry Moon, McCree's attorney, and Gordon Suber, the league's attorney, have lodged an appeal of the ruling in the Michigan Court of Appeals, but that appeal has reportedly been denied.

Further Complications

A new issue has cropped up in the case which further complicates the issues. Although 763 citizens voted in the election, only 746 of those voted for mayor. The others voted on bond issues and abstained from making any choice for the office of mayor.

Consequently, if all 763 people are allowed to vote, 17 people will be given another opportunity to express their choice even though they voluntarily refused that right in November.

"Equal protection is an integral part of constitutional law" and, if those 17 are allowed to vote for mayor, equal protection will be denied every other person who voted in the election, Moon said. There is no way to determine who those 17 voters were.

Legality Questioned

Moon also questioned the legality of the judge's order requesting that those voters in the two precincts vote the same as they did in November.

"In Anglo-Saxon common law there historically cannot be a court order issued which cannot be enforced," and there is no way to enforce this order, Moon said.

There is also the problem of voters who have moved, died or forgotten how they voted previously, he said.

Campaigning Restricted

The judge also restricted campaigning by the two candidates involved so that votes will not be influenced. Technically, however, Rutherford is not held to this restriction since he is not actually a party to the suit.

Clouded Issues

Political issues have clouded the legal issues involved in the case, Moon said. Judge Biven is up for reelection and is currently campaigning in the primaries, he said.

"The judge makes a statement to the press every day before the trial resumes concerning the incompetence of Suber and Moon and the delays in the case," Moon said.

The present mayor was also the former chief of police and the losing candidate is black, which bring both political and racial overtones to the case, Suber said.

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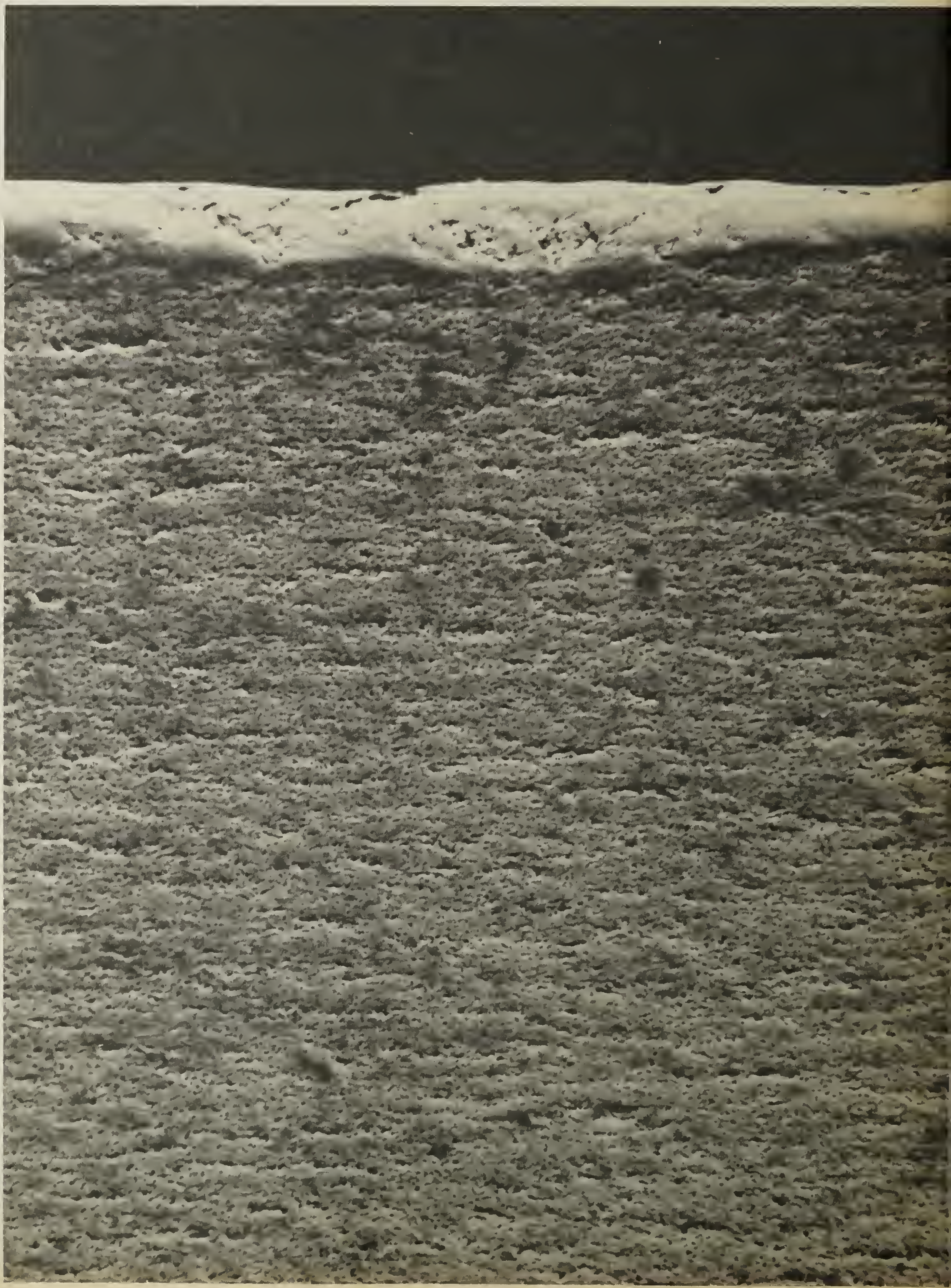

Call for Papers

12th MEETING OF THE COMPUTER PERFORMANCE EVALUATION USERS GROUP (CPEUG), Nov. 8-12, San Diego, Calif.

Papers are solicited on topics such as "The Cost/Benefit Issue of CPE," "The Oesign and Implementation of Performance Management Information Systems," "Oata Base System Performance" and the choice between in-house systems and commercial services for federal ADP support

Abstracts of papers for the general sessions, outlines for tutorials and suggestions for workshop topics are due by May 15. Three copies should be mailed to the Capt. Gilbert W. Joseph, CPEUG program chairman, at Fedsim/AY, Washington, O.C. 20330.

NINTH ANNUAL WORKSHOP ON MICROPROGRAMMING (Micro-9), Sept. 27-29, New Orleans.

Topics to be covered at this Institute for Electrical and Electronics Engineers workshop include, but are not limited to, high-level language support via firmware, operating systems support via firmware, performance measurement and evaluation.

Preliminary copies of proposed papers not longer than 20 pages should be submitted May 15 to Prof. Peter Kornerup, Micro-9 program chairman, at the Computer Science Oepartment, University of Southwestern Louisiana, Box 4-4330, Lafayette, La. 70504.

17th ANNUAL SYMPOSIUM ON FOUNOATIONS OF COMPUTER SCIENCE, Oct. 25-27, Houston.

The Institute of Electrical and Electronics Engineers is seeking papers that describe original research in the theoretical aspects of computer science.

Typical topics would include analysis of algorithms, computational complexity, formal languages and semantics, mathematical theory of computation, switching and automata theory, theoretical studies of computer systems and theory of programming and compiling.

Seven copies of a detailed abstract must be sent by May 17 to Prof. Michael J. Fischer, Department of Computer Science, FR-35, University of Washington, Seattle, Wash. 98195.

CSI Security Workshops Planned for Six Cities

NORTHBORO, Mass. – Two workshops designed to help computer users protect their installations from physical disasters, unauthorized system access and other data security threats will be given by the Computer Security Institute (CSI).

The workshops, "Computer Security Risk Management" and "Physical Security and Disaster Recovery," will be limited to 25 people to ensure "in-depth coverage of these two specific problem areas," John O'Mara, CSI director, said.

The computer security workshop will be presented in New York on April 20-21; in Chicago on May 10-11; and in San Francisco on June 21-22.

The physical security workshop is scheduled for Philadelphia on April 22-23; St. Louis on May 12-13; and Denver on June 23-24.

Cost for the workshop is $350 per registrant, with discounts for CSI members. CSI is at 43 Boston Post Road, Northboro, Mass. 01532.

Societies/ User Groups

ABA Slates Programs On Legal Issues of DP

NEW YORK – The American Bar Association (ABA) Section of Science and Technology will present four half-day programs on "Emerging Legal Issues and Impacts of Electronic Data Processing" at the Waldorf-Astoria here May 13-14.

Topics to be covered are electronic funds transfer systems, electronic stock transfer, privacy and taxation.

Further information is available from Richard M. McGonigal, ABA, 1155 E. 60th St., Chicago, Ill. 60637.

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Calendar

May 17-21, Los Angeles – **Computer Statistical Packages** sponsored by the University of California Extension. Contact: Short Courses and Conference Office, Continuing Education in Engineering and Mathematics, 6266 Boelter Hall, UCLA Extension, Los Angeles, Calif. 90024.

May 18-20, Washington, D.C. – **Civil Engineering Program Applications (Cepa) 23rd Semi-Annual Conference.** Contact: Everett C.E. Moone, Rummel, Klepper and Kahl, 1035 N. Calvert St., Baltimore, Md. 21202.

May 18-21, St. Louis – **American Institute of Industrial Engineers (AIIE) 27th Annual Conference and Convention.** Contact: AIIE 1976 Annual Conference, 25 Technology Park/Atlanta, Norcross, Ga. 30071.

May 19-21, Los Angeles – **Comparative Data Base Management Systems,** sponsored by the University of California Extension. Contact: Dr. Warren Pelton, Department of Management, Labor and Business, UCLA Extension, P.O. Box 24902, Los Angeles, Calif. 90024.

May 22, University of Southern California – **Ninth Annual Spring Systems Seminar,** "Here Comes Tommorrow – Are You Ready?" Contact: Nicholas Di Croce, Transamerica Information Services, P.O. Box 3899, Los Angeles, Calif. 90051.

May 23-26, New Orleans – **International Conference and Business Show of the Insurance Accounting and Statistical Association (IASA).** Contact: Robert D. Miller, IASA, P.O. Box 2100, Bloomington, Ill. 61701.

May 24-25, Chicago – **EFTS – Be Prepared,** sponsored by Payment Systems, Inc. Contact: Meeting Coordinator, Payment Systems, Inc., 90 Park Ave., New York, N.Y. 10016.

DPMA Schedules June 1 Seminar On Privacy Legislation Impact

CHICAGO – A seminar on the impact of privacy legislation will be held here June 1 by the Data Processing Management Association (DPMA).

The purpose of the seminar is to provide DP personnel in the private sector with an understanding of the problems encountered by government agencies in complying with the Privacy Act of 1974, according to George Eggert, DPMA international vice-president of program development.

Panel Members

Panel members invited to participate include officials from the Office of Management and the Budget, General Services Administration, Civil Service Commission, the National Bureau of Standards and the Domestic Council on the Right to Privacy.

The views of these officials should enable DP managers to anticipate the effects of proposed or pending privacy legislation in their states, Eggert said.

Further information on the seminar is available from DPMA International, 505 Busse Highway, Park Ridge, Ill. 60068.

Goldwater Set to Keynote AICPA Meeting Next Month

PHILADELPHIA – Rep. Barry M. Goldwater Jr. (R-Calif.) will be the keynote speaker at the American Institute of Certified Public Accountants' (AICPA) 12th Annual Conference on Computer and Information Systems, scheduled for May 10-12 here.

Goldwater will discuss protection of the privacy of computerized information about individuals. Included will be an explanation of the legislation he proposed to extend to the private sector the law controlling government use of computer data on private citizens.

The registration fee for the conference is $150. For further information contact AICPA at 1211 Ave. of the Americas, New York, N.Y. 10036.

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Editorial

Relief From What?

The Bell System has embarked on a determined effort to retain its favored monopoly status through congressional legislation.

Rather than accepting recent Federal Communications Commission (FCC) decisions as a mandate to full and fair competition, Ma Bell is now crying foul and mumbling vague threats about how the costs of basic telephone service will rise because of the revenues being siphoned off by the new specialized carriers.

In fact, MCI Data Transmission Co. (Datran) and the other specialized carriers have done very little siphoning and even less cream skimming. None of these newcomers have yet turned a profit from the competition which AT&T would have Congress believe is catastrophic.

The Bell System has been too busy crying wolf to look over its own shoulder at the record profits being racked up year after year by AT&T and its operating companies.

The truth is that AT&T has been waging futile regulatory warfare in an attempt to overcome interconnection and the competition of the specialized carriers.

In the case of interconnection, the FCC has provided a forum for Bell to prove its claims of undefined harm to the phone net. The case could not be proven because there was no data and nobody ever had the slightest intent of harming the network which all had to use daily.

So that issue has been properly killed and hopefully buried. But now in desperation the telephone companies are crawling to Congress for "relief." But relief from what? The highest profits in their history?

It has been hard enough for the specialized carriers to get a foothold and begin serving customers, given the endless redundant regulatory roadblocks raised at every turn by AT&T. But the FCC has worked hard to bring a bit of fresh air into the muddled monopolistic area of telecommunications.

Now AT&T would have all this progress overturned. It would make the state regulatory commissions supreme over the federal control they bemoan.

If AT&T would be honest with itself, it would admit that many of the new services introduced by the phone companies have been spurred by the competition. It is exactly for this reason that the FCC fostered competition in the first place.

If the Bell System would only devote its efforts to competing, everyone would benefit. But instead we see another futile Bell-inspired campaign to distort the truth.

Users are not innocent bystanders in this battle. If AT&T convinces Congress it has been victimized by the big bad nasty FCC, users will lose many of the alternative service choices that now exist.

As a positive step to counteract the Bell propaganda machine, users should document the positive effects of competition by writing their legislators, speaking at conferences, corresponding with the media, etc.

In its overzealous effort to get its own way, the Bell System may have miscalculated the mood of Congress. If the legislators perceive even a shred of evidence of benefits from the competition fostered by the FCC, they will never accede to Bell's efforts, especially in an election year.

It is up to each user of communications services to make his views known. Otherwise the exorbitant rate hikes of today will become the astronomical rate levels of tomorrow.

Letters to the Editor

Lack of GOTO Statements Essence Of Cobol Structured Programming

Edward G. Nilges painted a bleak picture of structured programming in Cobol [CW, March 22], but it is a distorted view. All of the difficulties he raised turn out to be irrelevant in practice.

We at Yourdon, Inc. have been preaching and practicing GOTO-less Cobol programming because we find it to be the most readable way to do structured programing in that language.

Despite what Nilges asserted, the syntax of a program, its textual appearance and lack of GOTO statements are the essence of structured programming, for these are the keys to readability.

Nilges proposed instead that GOTOs be used in a disciplined fashion to implement the basic structures. This is great in theory, but we abandoned that position nearly a year ago because we found it hard to maintain code once the structuring information has been "compiled out."

Yourdon promulgates a standard for structured programming in Cobol that is brief and to the point.

We send this standard out free to our friends who request it.

P.J. Plauger
Vice-President

Yourdon Inc.
New York, N.Y.

Age-Old Dilemma

In the article on "Structured Code Can Be Built – Even With Cobol," I agree that the main reason for using structured programming is clarity and maintainability.

However, I think one main point that was omitted was the fact that maintenance programmers, who are usually junior and less experienced, have a tendency to shuffle logic around in a quick-fix environment.

By altering a once well-structured program into a less modular one and multiplying this effect by the number of quick fixes, we end up with a usual, unstructured, operational problem program.

This brings us back to the age-old dilemma of time to write vs. practicality.

George B. Scoville

Tupelo, Miss.

HP Systems Have One Failure/Mo

Hewlett-Packard (HP) Computer Systems Group would surely have overworked customer engineers if our HP 3000 computer systems failed as often as stated in the recent interview article with me [CW, March 15].

Our current performance is one software failure per week and one hardware failure per month.

Ed McCracken
General Manager

HP General Systems Division
Santa Clara, Calif.

No Experience With Motor Oil

The letter, "Tip of the Iceberg" [CW, March 8], from Robert G. Frerking seemed to present me with a wonderful opportunity for new employment!

I have had experience in the Lincoln four-door field as well as with Champion spark plugs, radial tires and Phillips 66 gasoline.

Obviously I am not suited for the position since I have never had any experience with his "Havolin" motor oil. I very much regret that all of my experience is with the "Havoline" brand motor oil.

Since I agree with his assessment of ads with such specific requirements, I certainly would not apply for his chauffeur position since the motor oil would be so very different from what I've experienced!

Ron Truax

Minneapolis, Minn.

Data Past

Five Years Ago
April 14, 1971

NEW YORK – The cost of employing a programmer in 1970 dropped 2% to 10% from the previous year, according to a study performed by Robert Half Personnel Agencies. The most drastically affected position, the study said, was DP managers at large installations – their starting salaries were off a full 10%.

– – –

WASHINGTON, D.C. – A Justice Department data bank containing dossiers on elected officials, along with 14,000 other persons, was reported in a *New York Times* article. The files were said to be maintained by the unit which concentrates on black militants, opponents to the war in Indochina and New Left activists.

Eight Years Ago
April 10, 1968

BOSTON – A U.S. district court jury here found IBM guilty of breach of warranty in the five-year legal skirmish with Food Center Wholesale Grocers, Inc. (FCWG) and awarded the firm $53,200. In addition, the court found rentals due on FCWG's 305 Ramac installation to be only $25,602 rather than IBM's computed rental of $37,741. The case was reported to have been the first of this nature IBM has lost.

– – –

NEWARK, N.J. – The first on-line banking system in the country, the Teleregister system, installed at the Howard Savings Insitution here, was retired because of old age.

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- ☐ INFORMED
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- ☐ ALL OF THE ABOVE

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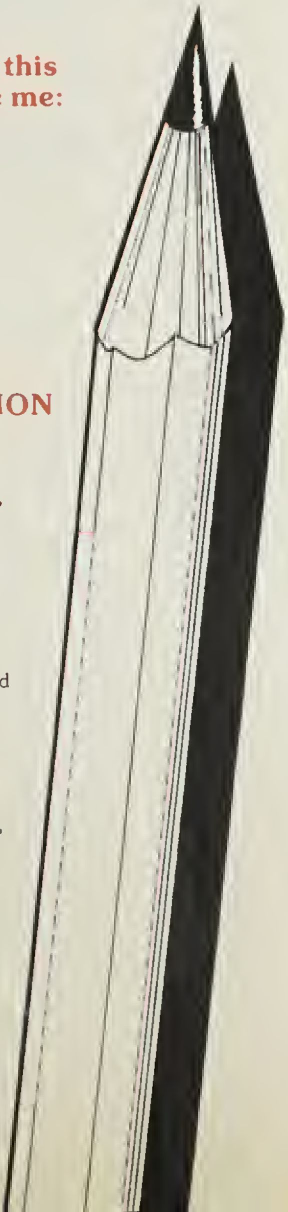

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ACM: Highbrow or Human?

Our entire trade – or profession, as it is sometimes laughingly called – interacts with society. The privacy issue, the licensing of data processing people, Federal funding of computer research such as ARPANET, freedom to travel and publish for intellectuals, and a hundred other such matters surround us on all sides. Many CW readers belong to one of the computer organizations: IEEE/CS, ASM, DPMA and ACM, most commonly. Of these, the hardware boys tend to look at social issues and see technical challenges; they look at privacy and see hardware and software security. The management people tend to look at social issues and see budget and personnel problems; they look at privacy and see increased data bank costs. And the computer scientists look at social issues and see – well, in ACM, where there are many computer scientists but also many advanced applications people with real problems, it isn't clear . . . yet!

For the first time in the almost thirty years of the Association, anti-Establishment candidates have been nominated by petition, in the May biennial elections. There has nevertheless been an explicit gentlemen's agreement to avoid, or at least to carefully balance, discussion of the more divisive campaign topics in the ACM *Communications* and other publications. In fact, a letter from one of the presidential candidates was recently withdrawn from the ACM Forum, perhaps because it became clear that the editor would publish an equally lengthy and fairly pungent reply from the other camp, and invidious argument would break out.

Now, however, in the March CACM, without notice to the opposition, and too late for rebuttals to appear before the ballots are counted, the leader of the Establishment has published a very vigorous and well-argued defense of the Highbrow position: 1800 words, almost four times as many as the electioneering statements permitted the actual candidates. These statements, by the way, will appear in the April CACM; they were written weeks ago, and changes in rebuttal to the March letter are not possible.

I will not bore readers with 1800 anti-Establishment words, nor would CW print them if I tried. I think it fair, however, to summarize briskly the humanist position. They favor a diminution of the scientific/technical/educational purity of ACM, and a corresponding increase in guild and policy activities. They believe that ACM members are human, members of society, a part of the main – not just emitters and receptors of technical data. They do not believe that the resources of the Association, or the energies of its volunteer management, are so limited as to preclude discussion of social issues, when those issues directly concern our trade, its people, and the ACM.

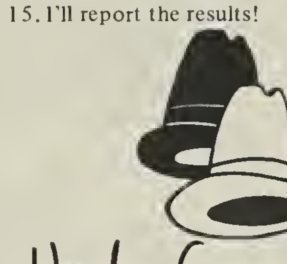
This is not a minority problem. As the Council vote on the Turchin matter – attempted assistance to an ACM member under pressure in Moscow – revealed, there are more publicans around the table than Pharisees. And I believe it is so among the entire ACM membership, old and young, town and gown, cabalist and COBOL users.

Referring to matters like Turchin, and the efficacy of the anti-ballistic-missile system, one ACM member wrote, "I belong to a church and a national political party for those purposes . . ." But did his church or his party speak out for Turchin, or against the ABM? Or contrariwise? Does not he have more leverage in such matters, and in guild affairs like the licensing issue, as a member of ACM, than as a Methodist or a Republican? Do these organizations actually draw on his special knowledge and his connections?

The Establishment masks indifference, a superiority complex, and outright hostility behind its purity. Portable pensions should not be discussed, or job-hunting encouraged at meetings or in newsletters, it says; what it means is, *worthwhile* people have tenure and the AAUP, or the warm arms of Mother IBM, to protect them. It grudgingly permits a special interest group on computer/society interactions, but prohibits it from speaking for ACM. It grudgingly permits the adoption of a code of ethics, but overwhelmingly defeats the enforcement provisions. It boasts of the uniqueness of our technical operations, and in the next breath says expulsion from our Superior Society is a meaningless penalty for malfeasance.

"There are people," runs the Establishment letter, "who are members of ACM solely because they wish to get the full scope of technical benefits . . ." Of course there are – thousands of them. But there are many others who joined for the human association, the friendships, the gossip, the opportunity to do good in their professional and local communities, not just to write, referee and read arcane dissertations. In the view of the humanists, the hundreds (perhaps thousands; no one knows for sure) who slip away from membership because they grow tired of our vaunted publications, our lack of blood and guts, our conservatism – these are great losses to an organization which could represent the concern, the humanity of the computer trade, as well as its cleverness.

Well, ballots went out last week and will be counted May 15. I'll report the results!



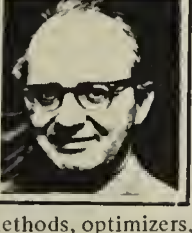
Herb Grosch

Second-Generation Software Still Not Problem-Free

For every dark cloud there is a silver lining – so the proverb goes. This may be so, but the other side of the coin is that for every bright cloud there is a dark part, and this is just as clearly true.

Take for instance the current situation in programming products. They have recently – very recently – safely entered into their second generation. No longer are programs simply a product of in-house skills based upon vendor-supplied software.

The Taylor Report
By
Alan Taylor, CDP



Programming systems nowadays, as a matter of course, are built from many competing outside sources. Utilities like sorts, communications systems, data base systems, access methods, optimizers, flow charters, librarians, report writers and many, many other types of systems software flow into the data center from outside – and not from the vendor of the hardware either.

Once inside, these software products often undergo a sea change. Sometimes they are used only as a basis for a total rewrite.

Sometimes, while being run in the way that was intended, the outputs are used for quite different purposes, as when what was designed as an accounting package is being used as a performance efficiency monitor. The running method was the same, but the afterrun organization was entirely different.

More and more, however, the outside programs are being run almost as black boxes, with such greatly improved operational characteristics that fewer and fewer installations, even in combination with their hardware vendors' representatives, are really able to say what is going on in detail.

Of course, the installation can say what is going on in the general way, such as: "The system functions normally by doing such-and-such and uses this type of access algorithm to reduce the search time for accessing some files or for safeguarding what the privacy of User A as against User B's unknown, and therefore untrusted programmers," etc.

There is plenty of this type of understanding. Most installations have full presentations tucked away in file drawers which explain the relationships between various features. But these all deal with the normal situation.

Abnormal Situation

Dealing with the important abnormal situation, which is the case when a previously reliable piece of software and some never-before tried inputs just don't come out with expected reliability of output, or even don't come out with output at all, is a different problem and one which has been evaded in the past.

True, most vendors can offer some help, which is generally all that is needed.

What concerns me here is the fact that there are no standards about how such items should be handled, nor about the strength or weakness of particular firms' methods of handling it.

And there are not even real approaches to a satisfactory solution.

Post-Mortem Approach

The standard current method involves sending an account of a problem, together with dumps, to the firm concerned and waiting for it to confirm that you can't read its manuals or that it doesn't know what happened either or that you have located an error.

The acceptance of an error having been found depends normally upon the ability of the software supplier to reproduce the circumstances in a type of "post-mortem" approach.

This was practical as short a time back as five years ago, when you could count the number of pieces of software, other than hardware vendor software, on the fingers of one hand.

Marginally, it is still true in some instances today. But tomorrow? No way will post-mortem be satisfactory as a sole solution. But that is only half the story.

The question of what will be satisfactory arises. What should a software/buyer look for in error protection? Well, here are some approaches that might work.

Redundancy Check

There are normally two or more ways of computing most things. If a piece of software uses faulty input, say, in two different manners, it is unlikely that the two faulty results will be equal. So by using only checked output, the problem of faulty input can, to some degree, be reduced by being caught and can also later be tracked by being isolated with the two incorrect results.

Where there is only one way available to compute the item, the effect of transients causing problems can be attacked by repeating the calculations a short time apart. Again, the answers developed are not used until they are checked equal. The time apart does not have to be long, but this approach may not be suitable where transaction processing is used.

Where there is neither time nor redundancy available, a special "dump" as to the conditions or factors involved in the running of the software can be a successful approach.

Here, the output takes along with it or puts out in some retrievable form the details of the computational environment at the time that computation takes place, so that any environmental error situations can be checked on if necessary.

Checkable Publication?

One apparently easy manner of providing for such checks is to ask for the output to take along with it the details of its own computation. This can then be physically checked by the recipient (human or machine) before use.

While providing a very nice-looking output (from a security standpoint at least), this is no real solution, since, if mere use of the output can show the system to be out of kilter, then the error could have been caught on the spot by either the redundant or repetitive techniques.

So I just don't see this approach as more than a half-way house to the system-error problem. (It has some considerable interest, however, as a requirement from an auditing point of view.)

The spread of independent software in the past decade has been phenomenal, although it will almost certainly be eclipsed in the coming years. The danger to its acceptable use lies in many ways in the inability of most software products to prove themselves error-free or to know when they are being asked to do the impossible.

Both of these characteristics are needed for real product strength. The approaches above may permit a system to widen its acceptability in foul weather as well as in calm times.

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Reader Commentary

Product Designer Should Not Write Documentation

By Harold Schmardebeck

Special to Computerworld

Many companies in the computer industry are finding themselves in a common predicament: They have developed a marketable product; new applications for the product are being developed; and the product is receiving wider recognition in its marketplace, presumably giving the company a solid niche in a high-growth field.

However, these companies soon realize prospering in the competitive computer industry requires more than just selling their product as fast as possible. As in any lucrative field, competition soon stiffens, and with it comes demands from the marketplace for solid, responsive product support.

The area of support that gives many companies the biggest fits is documentation. Why? Invariably the individuals developing new products for the computer marketplace have engineering or marketing backgrounds, but no experience in documenting a technical product.

It seems logical that a designer with the ability to develop a sophisticated product would have no problem documenting it. However, in real life, various factors surface which can render the designer of a product a very poor documentor of it.

Designers who find their documentation duties distasteful and menial are common. They prefer to devote their efforts to their area of speciality, product design.

Often this attitude is mirrored in their documentation – the final document is poorly organized, incomplete and cluttered with irrelevant details disruptive to the flow of information. These and other documenting sins render the final document ineffective.

Possibly because of the nature of their vocation, designers tend to overstate engineering details when documentting their products, resulting in documentation which is at the wrong level of discussion for the user.

The document's purpose is to establish communication between the designer and the product's user; therefore, the level of communication must be understandable to both parties.

Additionally, detailed engineering documentation makes it very difficult to get an overall picture of the subject material. Finally, only rarely do users need or want information which is at the engineering design level.

Designers have spent a significant part of their life becoming specialists in their field. That field is not documentation; it is product design. To be a specialist in professional documentation requires as much time and effort as becoming a specialist in any field requires.

Essentials for Writers

So now, the point of contention becomes, "If a designer cannot professionally document his own product, how can a technical writer possibly do it?" If the professional writer possesses the following basic essentials, he should have the necessary tools to produce professional documentation:

- A general background in the same field as the product being documented is an asset to the writer; but this does not mean that the writer must have the designer's intimate knowledge of the product before beginning his writing.

To start writing only after assimilating this level of knowledge would be very inefficient. For example, if the product to be documented were a software package written in Cobol, general experience with Cobol would be a very helpful background, whereas experience in a scientifically oriented language could still be an asset to the writer.

- The writer should have sufficient previous writing experience to know how the documentation can be best presented. He should know, or know how to find out, the type of information needed by the document's users.

- The most critical of all requirements for a professional writer comes under the category of information transfer. The writer must have the ability to establish an efficient transfer of information from its present source to his mind.

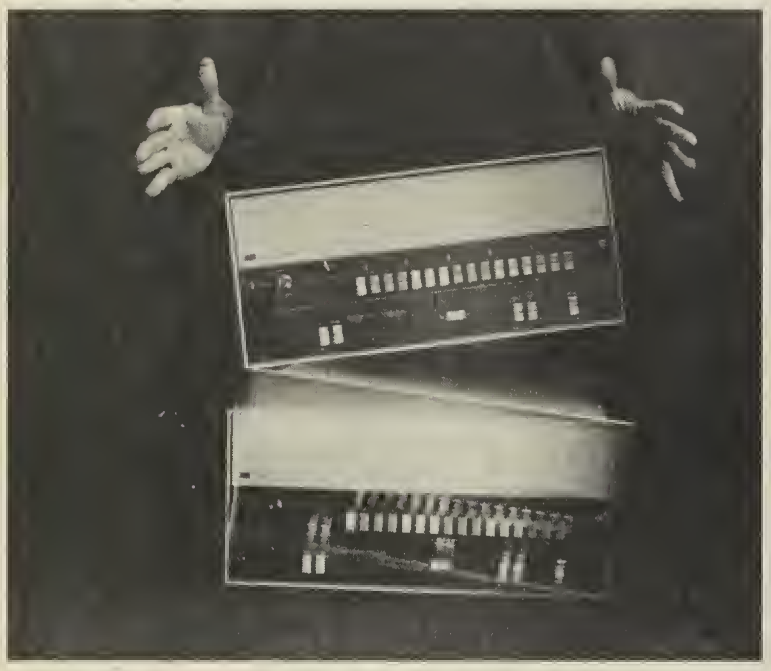
Whether the needed information is in the designer's mind or in detailed engineering documents, the writer must be able to set up a streamlined operation to facilitate this information transfer. If he is very adept at this technique he can to a degree offset some lack of the first two points mentioned.

Most likely, one specific question now comes up: "If this is all that a writer needs to produce top-quality documentation, how can it all come about?"

The third point above, estab-

(Continued on Page 20)

THIS OEM ASKED US TO BE TOUGH.



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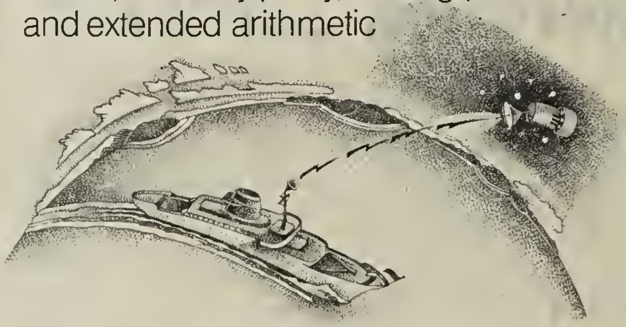

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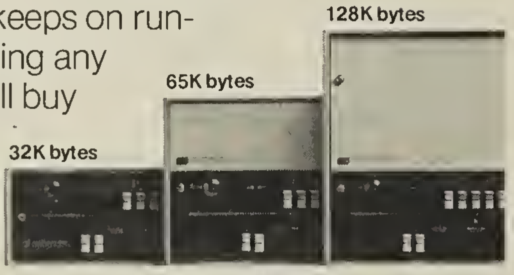

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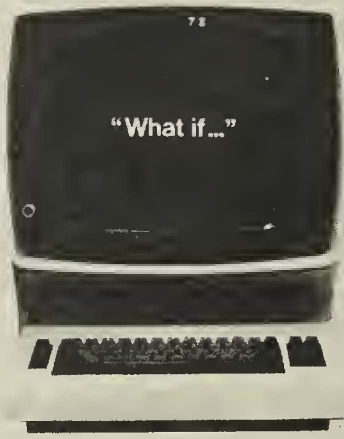

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The Software Manufacturer

Documentation Task Of Technical Writer

(Continued from Page 18)

lishing an efficient information transfer, is the key to it all. But a successful documentation effort requires more than a talented writer; it also requires a commitment from management for some necessary resources.

Specifically, someone must be assigned as technical advisor to the writer. This person must have sufficient background to supply the writer with the necessary information about the product. If he does not know everything about the product, he must know where to get the necessary information.

Another area requiring management support relates to reviewing the document after it is written. Management should appoint a group of people to be responsible for evaluating the document before it is printed. All departments which are impacted by the document should be represented. Users of the document should especially be included.

Given this management support, the writer has what he needs to produce the document. One of his initial efforts is to determine the assets of his technical advisor as an information source. He must determine how to best utilize his advisor while only using a minimal amount of his time.

It must be reemphasized that this writer/technical advisor liaison is crucial to the success of the documenting effort. The technical advisor cannot be put in the role of doing the writer's job; he is only functioning in a part-time advisory capacity, performing such services as describing functional areas, clarifying technical details, directing the writer to other information sources and reviewing drafts for accuracy.

Awareness Critical

Once the smooth exchange of information is established and the document begins to take shape, an attitude of awareness must be assumed by the writer. This attitude of awareness, critical if a high-quality document is to be produced, calls upon the writer's previous experience to determine if all pertinent areas are covered; whether the document is developing in line with original goals; whether areas superfluous to the user have been excluded; and whether the document's structure is the best for the user's needs.

The role of the professional writer is especially crucial to the computer industry. In many instances, the purchaser of computer-related commodities has nothing more than a reel of tape to show for an expenditure of thousands of dollars. That plus the documentation.

Being in this crucial position demands much of a professional writer. If he has developed his skills in his profession, he provides a service that is essential to the prosperity of the computer industry.

Schmardebeck is a consulting writer, Cincom Systems, Inc., in Cincinnati, Ohio.

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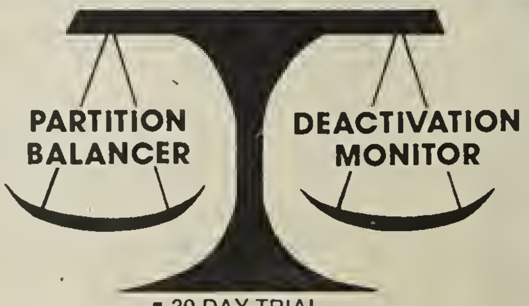

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Sort Improved

NEW YORK – Release 3.2 of CA-Sort II from Standard Data Corp. (SDC) is said to extend the package's ability to outperform sorts provided by IBM.

SDC has also upgraded the OS version to include an Include/Omit control statement, permitting the user to conditionally insert or delete records.

The OS user is also provided automatic secondary allocations and space release for work files for both fixed and variable-length records.

Support for alternate sort parameter input, included in Release 3.2, permits the passing of optimization parameters to the sort if it has been invoked from a user program.

License fees are $5,500 for the DOS version; $7,000 for the OS version.

Standard Data is at 1540 Broadway, New York, N.Y. 10036.

Reclaiming a System – Part 1

Training Eases File Management Update

By Don V. Fletcher
Special to Computerworld

LIVERPOOL, England – One of the largest computer software applications in the world may be the 20-reel, 3-million-record tape file belonging to Royal Insurance here. The combined agency/policy/claims system, consists of some 800M bytes and takes nearly four hours to run on our IBM 370/158 with 1M byte of memory.

The information processing method we were using in 1973 had been designed in the mid-1960s. We found ourselves with a system that was inflexible, slow to respond to change and from which it was difficult to obtain all of the information needed.

Earlier in 1972 there had been many changes in the company's structure and business operation. A new system of branch and subbranch agency offices was established; several new insurance products were introduced; and extensive new governmental reporting requirements had been enacted into law.

Added to this was the fact that the data processing department had been reorganized.

Although the old system was running on an IBM 360/50, it was to a great extent the direct descendant of the old renewals and accounts systems which had been the first subject of mechanization. The system was primarily designed for specific applications and it was difficult to graft other applications onto the system.

Objectives Listed

Early in the planning stage, objectives for the new system were listed. Flexibility and rapid response to change headed the list, with the capability of providing a wide variety of information as the number three objective.

Additionally, the system had to be capable of having information integrated throughout the entire system. Royal also wanted the system to be an evolutionary step in the direction of a data base system.

Other requirements were that the system be easy for the user to operate, and, finally, it was essential that we have a quick implementation.

We felt we must have a data-oriented system for flexibility, one which had data independence; there had to be ease of coordination of the various files throughout the system; we needed a rapid implementation time frame and a system easy to develop and maintain.

In other words, we clearly needed a good file management system. We wanted a method by which we could adopt the philosophy of use of machine power rather than the heavy use of skilled people."

Attended User Meeting

Royal's evaluation team surveyed the available software systems. After presentations on Informatics, Inc. Mark IV in April 1973, the team attended a UK MARK IV user's association meeting. There, Royal DP personnel met with many Mark IV users, several of whom they later visited.

Finally, we sent one of our senior analysts to a Mark IV training class. Evaluation was completed in May and one month later Mark IV was installed.

We immediately began training our employees in the use of Mark IV. We filled every available place in Mark IV classes and, when that was not enough, special on-site classes were arranged with Informatics, Inc.

By the end of 1973, some 50 people had attended at least one Mark IV course. During the learning phase, experience with the system was obtained by producing reports from their staff files and by writing a program to analyze the employee pension plan.

The success Royal has enjoyed with Mark IV is because of our early commitment ot a heavy and vigorous training program.

The Mark IV classes were very helpful in generating enthusiasm for the system, as well as preparing our staff to handle the work technically.

Fletcher is systems manager at Royal of Liverpool. In his next article, he will describe how the firm implemented the Mark IV-based system.

Exchange Performs Chore of Marketing Mail-Order Software for Developers

SAN FRANCISCO – The Computer Software Exchange has been organized to support DP installations that have developed programs for their own purposes, but now see they might be useful to others as well.

In contrast to firms whose business is selling software, these developers generally don't want to devote resources to the marketing of their programs. The exchange is intended to take over that chore and to isolate the developer from the user, a spokesman explained.

Developers are invited to request an input documentation package through which they can formalize the submission of their programs to the exchange. This "package" calls for a complete description of the program from flowcharts, printer layouts and narrative write-ups to installation and operating instructions.

The effort of completing the documentation and the $25 registration fee for each submission should combine to screen out "the dogs and cats we'd get" if the listing was completely free, the exchange said.

Once submitted, the name of the program and a very brief description will be included in a catalog available for $5 to anyone who sends for it. More extensive abstracts of the programs are available from the exchange once the user has determined which programs are of interest.

The abstracts are sent out on request along with a schedule of fees and an order form. The fees charged are set by the exchange and, when a program is sold, the developer receives 50% of the price.

The fees will generally be far lower than what the professional software houses charge for comparable programs, the exchange said, since what the exchange offers is essentially mail-order software that is not supported.

The goal is to distribute the software as widely as possible and to keep the costs for the user down while providing the developer a means of recovering some of the money already spent on a project.

The Computer Software Exchange can be reached through P.O. Box 27193, San Francisco, Calif. 94127.

S/32 Packages for Distribution, Accounting Available From IBM

ATLANTA – IBM has announced a quartet of Distribution Management and Accounting Systems (DMAS) intended to help first-time users in a variety of businesses become operational on System 32s.

Billing, accounts receivable, inventory control and sales analysis are the applications provided by these packages, which are individually tailored to firms distributing tires; wines and distilled beverages; toys, sporting good and recreational supplies; and services supplies.

Services Supplies Systems

The services supplies system is intended for distributors who serve barber and beauty shops, shoe repair stores, schools, tailors, the medical industry, restaurants and other service-oriented operations, IBM explained.

The toys DMAS includes support for an open order file and warehouse sequenced picking lists, automated pricing and discounting and analyses to help determine best stock mixes and improve customer service.

Beverage Package

The wholesale and distilled beverage package combines the basic applications and produces several reports said to be useful in dealing with federal and state regulations. These include, for example, a gallonage accumulation report, the spokesman said.

The tire DMAS allows the user to "future date" customer needs and to split invoiced amounts into monthly installments to encourage early placement of orders for seasonal items such as snow tires.

Availability of DMAS

The tire DMAS will be available in May, and the rest are available now for initial charges ranging from $2,500 to $3,120, followed by monthly license fees from $120 to $147. They are being distributed by IBM's General Systems Division, based at P.O. Box 2150, Atlanta, Ga. 30301.

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Package Restricts Data Access

PHILADELPHIA – Enhancements to the TPF&C retrieval system developed by Towers, Perrin, Forster & Crosby, Inc. enable data base administrators and others to restrict the data a given user may access even while others are free to access the same information, the vendor said.

By allowing separate data dictionaries for each user without requiring any physical separation of dictionaries, data or requests for information, each dictionary can be structured to assure the privacy of the fields accessed, a spokesman said. Users may, however, have access to overlapping or mutually exclusive sets of data, as circumstances require, the spokesman added.

Although the package is tied to no specific data base management system or file organization, the "privacy locks" have the same effect as the Codasyl specified system of schema and subschema, he said.

Written in BAL, the package runs in 64K of memory on IBM 360/370 equipment.

Cost and packaging varies. The package can be used for any single application for $7,500, which covers the cost of object code. Multiple application use and the system's source code costs $10,000.

Interfaces to data base management systems are extra-cost options, he noted.

The firm is at Centre Square West, 1500 Market St., Philadelphia, Pa. 19102.

Manufacturing Package For Use on Small Systems

DOWNERS GROVE, Ill. – Written in Basic, the Comprehensive Manufacturing System (CMS) from Advanced Business Concepts, Inc. (ABC) is designed to support a range of application areas interactively on various small business systems or minicomputers, the vendor said.

Order entry, invoicing, accounts receivable, sales history and purchase order scheduling are all included as standard features in CMS. So are bill-of-material processing, inventory control and management, general ledger and vendor analysis, a spokesman added.

To illustrate the integration of these functions, he outlined the following chain of events: shortages of items in some levels of raw materials generate a requirement for those subassemblies or parts. At the operator's option, either shop orders or purchase orders for the items may be produced.

Economic order quantities or production quantities and standard reorder points are taken into account during this process, he continued. Confirming the purchase order or the shop order updates the appropriate on-order fields in inventory for subsequent order entry processing.

Finally, when the shop orders have been completed or the items covered by the purchase orders received, the on-order and on-hand quantities are adjusted.

Currently available for use on Basic/Four Corp. systems and "certain" Data General Corp. models, but said to be adaptable to other minis as well, CMS can be acquired under license for $25,000.

ABC is at 515 W. Ogden Road, Downers Grove, Ill. 60515.

Query Software Aids IMS Users

ROSSLYN, Va. – In?uiry/IMS from CGA Computer Associates, Inc. was designed to allow users of IBM's Information Management System (IMS) or IMS/VS to access their data bases easily and efficiently, CGA said.

The package provides the user an English-like language and operates as a message, message batch or batch program. It is primarily intended, however, as an on-line application, the vendor said.

As with many query languages, In?uiry/IMS was "designed for all users regardless of their technical orientation." In common with most packages working from a data base management system, it does not require the user to know the physical characteristics or organization of the data base, CGA noted.

In addition to inquiry and retrieval capabilities, the package includes facilities for arithmetic operations on stored data fields and on "constant" values introduced by the user. It also provides data field security at the terminal level and minimizes IMS overhead through inquiry page and time limit specifications at the logical terminal level, CGA said.

Designed for "all IBM-supported terminal types" or their equivalents, the package requires only the user's OS or OS/VS – which is not modified for In?uiry/IMS – and IMS or IMS/VS. There is no need for either Data Language/I (DL/I) or the Time Sharing Option (TSO) software, a spokesman emphasized.

In?uiry/IMS is available for $22,000 from CGA at Suite 1015, 1901 N. Fort Myer Drive, Rosslyn, Va. 22209.

At last, a system that makes credit verification as simple as it should be.

Ideally, credit card and check verification should be a simple "yes" or "no" proposition.

Unfortunately, at a lot of banks, supermarkets and other retail outlets, it's a complicated, time consuming process.

To solve the problem, Bell has designed the fast and simple to operate Transaction* telephone system.

The system includes the Transaction telephone terminal, the switched network, and 407 type data station interface. Plus, the data base computer.

The terminal itself is intended as the remote telephone in a digital inquiry-voice answer system. It has a single slot through which automatic dialing and bank or credit cards are passed. (If it's a check, the user keys in the account number.)

The Transaction telephone automatically enters customer and user information by reading the magnetically encoded ABA Track II stripe found on the back of most major bank and credit cards. It also fully buffers all of the data input.

Sequential instruction lights guide the user through the simple data input procedure. While the data is being entered, the telephone dials the number of the data base needed for verification. All of the buffered information is then sped through the switched network and the 407 type data station. Customer information is withdrawn, and an audio or visual response is relayed to the user.

In addition, the terminal can be used as a regular telephone. And it's available in Touch-Tone® or rotary.

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The Transaction Telephone System.

Another part of the Bell System's end-to-end data commitment.

MRP Enhanced

WALTHAM, Mass. – A materials requirements planning (MRP) package for Honeywell Level 66 large-scale systems, IMS/66, operates on a "net-change" basis to reduce runtimes and keep information current, Honeywell said.

Written in Cobol/I-D-S, this data base and transaction-oriented system integrates product structure and cost control; inventory and order control; MRP; and, in a separately available module, statistical forecasting.

This version of the system reacts to the need for rescheduling open and released supply orders to maintain current, valid priorities from order-releasing to final shipment, Honeywell said.

The software costs $400/mo for the MRP module and $100/mo for the statistical forecasting and analysis modules, the firm said from 200 Smith St., Waltham, Mass. 02154.

'GraspVS' Runs in F0 Partition

BURLINGAME, Calif. – GraspVS, a spooling and resource management system for DOS/VS users, can now run in its own F0 partition, freeing all five normal partitions for application use, according to the vendor/developer, Software Design, Inc. (SDI).

Optional Enhancement

The package has also been enhanced to include, optionally, a resident transient feature. With this facility, users can retain the most frequently used "transient" routines of the DOS/VS supervisor in main memory, reducing the time needed to access these routines.

The charge for the F0 partition support is $65/mo; for resident transient, $40/mo. For a 158, the minimum cost of GraspVS is $240/mo., but users typically pay about $600/mo depending on options chosen, SDI said.

GE to Add European Supercenter

AMSTERDAM, The Netherlands – General Electric (GE) plans to expand Mark III service on its international remote-computing network with a third "Supercenter" to be located here.

Starts Next Year

The center is scheduled to begin commercial operations early next year when it will be "totally integrated" with the company's two Supercenters in the U.S., a spokesman said.

Mark III service is distributed in continental Europe by Compagnie Honeywell Bull, in the UK and in Italy by Honeywell Information Systems and in Denmark by OK Data.

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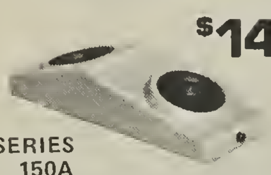

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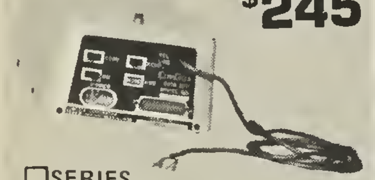

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With Poor Goals, CPE May Be Wasted

By Dan Coapstick
Of the CW Staff

Inherent in most well-meaning computer performance evaluation (CPE) programs are conditions which tend to limit the success of the program and, in extreme cases, bring about total failure. A subset of these conditions can be directly caused or created by inappropriate or inadquate managerial decisions.

Performance Evaluation

If an effort is to fully reap the widely touted benefits of CPE, all of the staff – from the top down – must understand the objectives and purpose of the program. Without sufficient definition, the entire program risks becoming an academic exercise in wasting time and money.

Prior to the initiation of specific work or the procurement of tools, a firm definition of the objectives is mandatory. Several typical objectives are increased throughput, reduction in DP expenditures through equipment reductions, extended serviceable life or system tuning and increased reserve capacity. The lack of established goals creates a tendency for recommendations to become divergent and the cumulative value diminished.

It is imperative that the objectives of the CPE program coincide and support the overall objectives of management. For example, if the management objective is increased throughput, a case for cost-saving equipment reductions on long-term leased equipment is pointless.

Side Effects

Generally the definition of objectives originates at a managerial level because of the necessary considerations of corporate and data center requirements. Almost as interchangeable in importance for a successful CPE program as the definition of objectives is management commitment.

More CPE programs fall short of the anticipated goals because of the lack of management commitment than probably any other factor. Included in the spectrum of management commitment is an adequate budget for tools and development efforts and the support and implementation of proposed recommendations.

In addition to hindering the success of the CPE program, lack of managerial support produces another detrimental side effect, that of damaging staff morale.

CPE efforts are almost universally met with enthusiasm and extraordinary efforts by the technical staff and, when the resultant recommendations fail to be implemented because of a lack of management support, the pervasive feeling of "who cares?" results. Management commitment is a mandatory, integral aspect of a successful CPE program.

Prevalent Deficiency

A prevalent deficiency in newly created CPE programs is improper organizational structure of the CPE group. The CPE staff ideally should function as a staff organization reporting to the center manager or director of computer operations.

If the CPE group is placed in a line-function organization, the proper visibility and responsiveness may be lost. In a line-function capacity, the CPE staff often becomes candidate for line-functions "crisis" problems and may lack the proper authority to initiate activities across line activities.

Actual data collection belongs at the line-function level, but technical direction and coordination should be removed from day-to-day activities.

Along with this form of organizational structure is the requirement that the line functions be educated about the purpose of the CPE group. Without the proper education and introduction into the organization, an unfounded alienation can arise. The CPE staff can be looked upon as an auditing group whose purpose is to find fault instead of the intended purpose of identifying problem areas.

Another factor that often contributes to the failure of a CPE program is the failure to identify cost savings. An often-asked qustion by those responsible for CPE effort is: "How much of my time should be spent justifying existence?"

If all recommendations by the CPE staff had actual or projected cost-savings figures attached, any other formal justification would not be required. This also has a reverse advantage in that is accentuates a responsibility and accountability in the CPE staff.

The proper staffing is as critical to CPE programs as it is to any other project. Senior level technical people who understand both the hardware and the operating system are obviously required, but the factor most often forgotten is that these people must interface directly with various levels of staff and management.

At least one of the individuals in the staff group must be able to communicate both verbally and in writing to guarantee the proper visibility of the proposed recommendations. There are many requirements to a successful CPE program, and the previously described aspects are most often the reason or reasons for limited success or complete failure.

These reasons are correspondingly the aspects that management is in the best position to control so as to effect a successful CPE program.

Coapstick is an associate in the performance services group of CACI, Inc. Federal Operations, based in Reston, Va.

Basic Added to Software Being Readied for 90/30

BLUE BELL, Pa. – Interactive use of the Univac 90/30 will be extended in May with the availability of the Very Interactive Monitor (VIM) as well as a Basic language processor and EDT, a text editor, to run under VIM, Univac said.

Working in an OS/3 environment, VIM supports terminals including Uniscope 100s and 200s and "industry-standard" hard-copy units with memory management and I/O functions for interactive work.

Monthly rental for VIM is $75; for Basic, $60; for EDT, $50.

470 Topic of Oserg April Meet

NEW YORK – Amdahl Corp. representatives will present a technical review of the Amdahl 470V/6 at this month's meeting of the OS Eastern Region Systems Group (Oserg), and the session will be open to nonmembers, according to the group's secretary, Ruth Johnert.

Both hardware and software capabilities of the IBM 370-compatible system will be covered by Amdahl. The vendor is also planning to have one or two users at the meeting to discuss the system's performance at their sites, Johnert added.

Oserg is made up of system programmers and managers from member installations in the New York City area who meet monthly to discuss state-of-the-art developments in software and hardware.

The meeting with Amdahl is scheduled for Friday afternoon, April 23, at one of the member installation's conference centers. More information is available from Johnert at The Home Insurance Co., 59 Maiden Lane, New York, N.Y. 10038.

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Systematic Approach Seen Needed

Employee Development More Than Career Pathing

By John P. Hebert
Of the CW Staff

ATLANTA – "In the past, computer hardware and software gathered the most attention and concentration in a company, but the emphasis is now shifting to 'peopleware' – an increasingly expensive and critical resource."

With that thought as the stimulus for recognizing the importance of computer department personnel, Richard Branton of Southern Services Corp. began a discussion on career pathing at the Computer Caravan here recently.

"The idea of career development tends to be a controversial item" Branton noted, claiming "accepted policies of the personnel department evolved from an era of blue-collar manufacturing."

However, those policies don't hold true anymore, he said. Things have changed chiefly because of the influx of workers with college degrees into the job market and the concurrent rise in employee sophistication, he explained.

It is important to realize "no aspects of the job environment exist in a vacuum. And the point is not whether [a career-pathing] system exists.

"The point is how systematically or deliberately or haphazardly you approach the system to continue to fulfill manpower needs while fully utilizing the resources available," he stressed.

For these reasons, Brenton said, it is important to have what he called a "manpower utilization and development system" which includes career paths, training, work assignments, position or job descriptions and installation standards for employees.

"If you have one employee, then you can have a career path," he said.

Part of this career pathing is training that is necessary and continuous before an employee can be promoted, Branton said, emphasizing the employee must be qualified.

Management Responsibility

In addition, "it is important for management to design the identifiable aims and identify the pitfalls," keeping in mind "employees know better what they want than does management," Branton said.

A formalized system can be beneficial to identify what's needed for a long-range viewpoint in terms of employees, he added.

Management wants to ensure employees can do the work the first day they start, but the employees are often given no training prior to their promotion, he stated.

Analysts in many shops are really just doing programming, while analysts are brought in from the outside to do the real analysis work, he noted.

This results in the antithesis of what should be the correct approach – "to increase the morale and initiative of employees so they can have some control over their own futures," he explained.

Peopleware

Furthermore, manager satisfaction is directly related to how employees feel, he added.

Often a more modest approach can be taken to career pathing than a formalized approach. "But in five out of six installations we studied, none had a fully integrated personnel movement system.

"It seems to be [the personnel department's] problem is failing to involve itself in projects," he said. The involvement of the personnel department should occur "after needs are determined, but before you do the work."

The advantage of a career path or a career ladder, Branton noted, is that it gives employees a sense of development toward a broader aim.

And, more importantly, if people can continue the workflow and solve problems quickly, then these people are worth possibly hundreds of dollars a day if a system has to be kept up and running, he explained.

That type of career-pathing system is working at Southern Services Corp., Branton said.

"We have one of the lowest salaries in the city at which to start – $500/mo" for an entry-level job, he said, "but we offer great salaries if the people stay with us – up to $15,000 or $16,000 per year – and we don't have problems with people leaving."

He credited Southern's training programs, career pathing and "fairness in rewarding employees equally" for this.

" 'You must permit your people to go to training,' we say to our managers. And you can't give a bag of apples to one employee or department and not give it to others," he said.

Noting the existence of a generally dissatisifed population today, Branton emphasized that popular support can change and this should be a major consideration and concern of management.

Deltak Conference Gets Under Way

CHICAGO – In a two-day conference opening today at the Hyatt Regency here, Deltak, Inc. is presenting to DP trainers technical sessions on basic problems and others on how Deltak products can be applied to those problems.

Focusing on ways to improve personnel productivity, Don Peoples of GTE Data Services will begin this morning's session. Concurrent sessions – to be repeated later – cover such topics as career path planning, data privacy and security and training for an IMS conversion.

Ed Yourdon and Larry Constantine will discuss structured programming and structured design this afternoon, and Patrick Mullin of Digital Equipment Corp. will discuss distributive processing tomorrow afternoon.

Interested people will be welcome at the door without prior registration, Deltak noted.

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IBMer Describes Digital Services

SNA Designed for Current, Future Carrier Offerings

By Ronald A. Frank
Of the CW Staff

MIAMI BEACH – IBM's Systems Network Architecture (SNA) was designed to operate with today's common carrier offerings, which include both private and dial-up lines and, at the same time, to be compatible with the digital carrier offerings that are expected, according to Edward Sussenguth, director of communications systems architecture at IBM.

Two major kinds of new carrier services will be offered, Sussenguth told an Interface 76 session on communications protocols here recently.

These will be fast circuit switching and packet switching, and both will be designed to handle the intermittent characteristics of data communications applications, he said.

Both will have a dial-up phase in which the user will have to go through a dial procedure to establish a connection with the other end of the data link. The costs of both will be similar, with the fast circuit "unit" costs approaching the volume-oriented costs of packet switching, Sussenguth said.

The protocols being developed for the new services, including SNA, have four levels. These are electrical, link control, end-to-end control and data control, he said. SNA is designed to operate within this type of protocol framework, he added.

Responding to a question from a session attendee, Sussenguth described IBM's Synchronous Data Link Control (SDLC) as essentially similar to the European Higher Level Data Link Control (HDLC).

The two are not precisely the same, however, since SDLC has some "test and diagnostic commands" that do not occur in HDLC, he said. The standards organizations now considering the HDLC protocol proposal have said they do not want to include these commands, he added.

An existing implementation of the HDLS protocol is the Standard Network Access Protocol (Snap) which will be used on the Canadian Datapac packet-switching network, scheduled to go into operation this summer, according to Tony Rybczynski.

The Snap protocol is the same as Recommendation X-25 recently proposed by a CCITT standards group in Europe, according to Rybczynski who is supervising engineer of computer communications planning at Bell Canada, which will operate the Datapac network. "In discussing Snap, we are really talking about X-25," he said.

For existing terminal types, Datapac will have Network Interface Machines (Nims) which initially will include keyboard terminals and some point-of-sale terminals, he said.

Access to the Nims include synchronous and asynchronous lines potentially using all existing protocols. This network access approach essentially is designed to accommodate existing prepacket-switching devices.

Datapac will provide a "virtual circuit" connection to the network, and this approach is the same as spelled out in the X-25 recommendation, Rybczynski said. Both switched and permanent virtual circuits will be available.

The user connects to the network with an interface that uses a "calling layer" portion of the protocol. This portion

(Continued on Page 27)

System Helps Retailer Manage Growth

NEW YORK – While "waiting for IBM to announce a 3600 series communications controller which can handle 50 or 55 terminals in each retail store for a low price," a retail chain here is using a computer and parts of the IBM 3650 retail store system to increase its profitability.

"All the technology is there," according to Leonard Nieman, vice-president of finance of Brooks Fashion Stores, Inc. However, Brook's won't buy that technology "if it costs $100,000 for a communiations controller to handle only seven units," Nieman said.

Meanwhile, Brooks installed an IBM 370/115 Model 2 last year, which is linked through hard-wire connections to an IBM 3657 ticket reader unit – a part of the 3650 retail store system. The system helps manage its growth of about 25 stores every year by providing tighter in-store merchandising control, according to Nieman.

In the past five years, Brooks, which operates principally in enclosed-mall shopping centers in 20 eastern, southern and midwestern states, has grown from 31 stores and sales of $7 million to 145 stores and about $50 million in sales.

"With this kind of growth rate, we realized some time ago that we needed to be able to make the right merchandising decisions for over 100 stores as fast as, if not faster than, when we had only a few," Joseph Saul, Brooks president, said.

"We needed to know almost instantly what was selling or not selling, and we needed a way to process merchandising information without substantially increasing the number of employees here at headquarters. The computer has become indispensible for increasing productivity and profitability," he said.

The CPU, an IBM 3657 ticket reader unit, IBM 3650 terminals and an IBM 3651 controller form the basis of Brooks Automated Merchandising and Business Information System (Bambi). The system provides company management with information on the movement of over 300 classes of merchandise in its sportswear, dress, coat and accessory departments, Saul said.

Bambi was designed by Brooks DP director, Murray Friedberg, around the 3657's computer-generated, magnetically encoded tickets, which are also computer-readable.

"One of the most important benefits of Bambi is that since we now have almost up-to-the-minute information on merchandise movement, slow sellers can be spotted faster and are not allowed to 'hang around' for eventual markdown," Nieman said.

"At one time, we had no way of quickly determining what wasn't selling; at the end of a season we had to keep lowering prices just to move the goods out. Now, weekly, 'flash figures' tell us what's selling or slow. We've drastically reduced markdowns, which had been a drain on profits," he said.

Bambi accomplishes its task by sending bulk orders for total store needs based on the computer's merchandising reports, to vendors.

The computer terminals print individual store order forms and transmit information on the orders to the ticket unit which prints the appropriate strips of 3-in. tickets, on which a magnetic stripe contains information about each item.

Purchase orders and tickets are mailed to each store, where the individual tickets are attached to the merchandise. When an item is purchased, the cashier retains a 2-in. portion of the ticket.

The accumulated sales tickets are mailed daily to the New York headquarters where they are read by the ticket unit.

Data is then communicated to the computer to record the sales for each style and store and reduce the inventory.

Based on the information read from the tickets by the 3657, the system prints daily, weekly and monthly reports for management review and decision making.

The computer system also handles Brooks' order entry – through IBM 3270 CRT terminals – as well as payables and general ledger.

Xylogic Unveils Multiplexer For Users of DEC PDP-11 Minis

BURLINGTON, Mass. – Xylogic Systems, Inc. has introduced a microprocessor-based asynchronous communications multiplexer for use with Digital Equipment Corp. PDP-11 computer systems.

All data transfers in the Model DP-11 are performed with direct memory access (DMA), and the unit utilizes one common set of I/O device addresses and a single interrupt independent of how many channels are being serviced, the company said.

The multiplexer can be expanded in four-channel increments from four to 128 channels by plugging in boards, with minimal impact on software, according to the firm.

Three selectable transmission rates from 50- to 9,600 bit/sec are possible within each group of 16 channels.

The basic module consists of one control board which can drive up to two interface boards and an interface board containing either four or eight interface channels, Xylogic said.

Two standard peripheral controller slots in any PDP-11 will hold the minimal multiplexer module; 128 communications channels can be accomodated in standard PDP-11 systems units, it said.

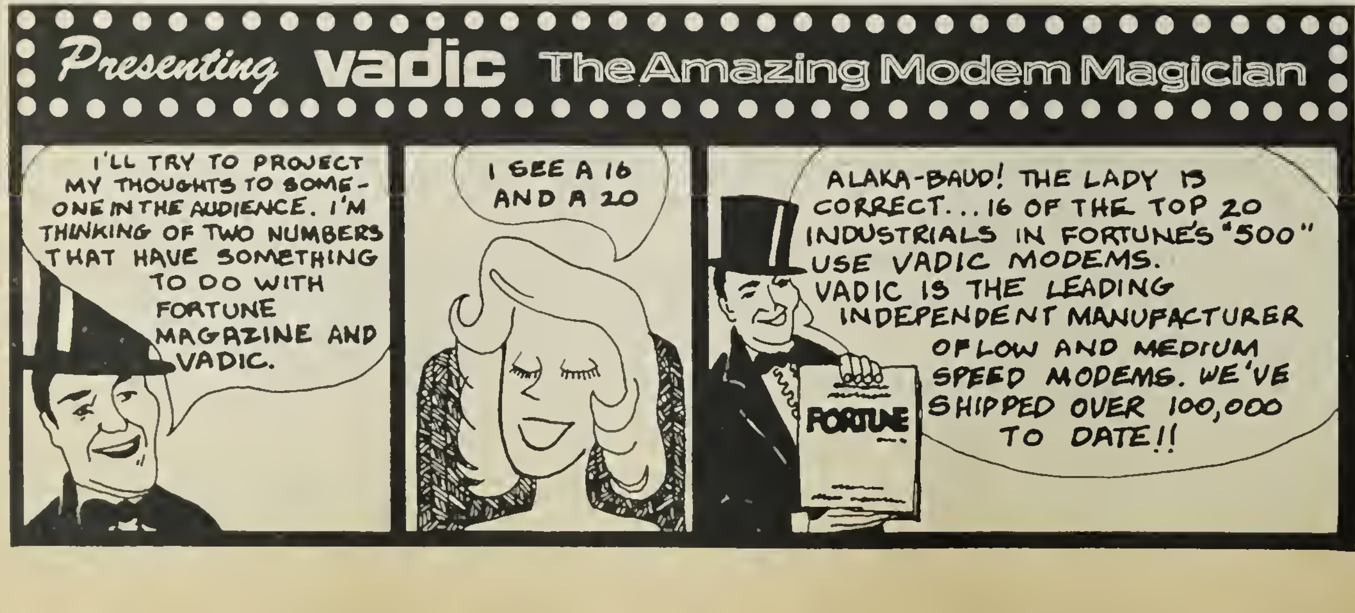
The DP-11 minimizes software overhead by automatically performing all I/O message transfers via DMA techniques, it said.

The unit is also less susceptible to data loss during power failures, etc. because all control, registers and character buffers are contained in the mainframe memory, Xylogic claimed.

Standard features of the DP-11 include automatic input by DMA to core memory buffers; selectable auto echo capability; 5-, 6-, 7- or 8-bit character length; even, odd or no parity; and full- or half-duplex operation, it said.

External interface options include RS-232, 20 mA current loop or open collector TTL. Separate communications connector panels are also available, it added.

The DP-11 multiplexer costs $1,550 for four channels, $1,900 for eight channels, $2,350 for 12 channels and $2,700 for 16 channels, with delivery in 60 days from Xylogic at 42 Third Ave., Burlington, Mass. 01803.



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Efficiency, Time Savings Benefits of Schools' Systems

CHERRY HILL, N.J. – The increased efficiency of the communications system used by the public schools here for financial and student applications is something which "can't be put in terms of dollars and cents."

According to William T. Hicken, director of computer operations for Cherry Hill Public Schools, "the system is not too costly considering the savings in time" experienced.

It handles central warehousing, purchase order writing and material bid processing functions, a student data base for 18,000 students and a host of batch processing functions, Hicken said.

The system is centered around a Univac 9480 CPU with 131K core storage, seven Uniscope 100 CRT terminals, a 1,000 card/min card reader, two Univac 6C tape drives, two Univac disk drives and an 1,100 line/min printer, he said.

The schools' on-line communications network operates over dedicated phone lines operating at 2,400 bit/sec through Bell 201B modems located in the computer room and at three other sites, Hicken added.

The communications system operates from 8 a.m. to 5 p.m. every school day and the batch system is in operation for 12 hour/day, five days a week and "runs right through the Univac equipment in the main computer room," he noted.

The CPU can run all jobs easily, including the communications system, and it has the capacity to run five jobs simultaneously, according to Hicken, who was responsible for the system's setup.

The benefit of the communications portion of the system is "efficiency more than anything" for the schools' 1,800 employees, he remarked.

"For example, we never processed all the purchase order writing until we had the communications capability - before that, we were bottled up.

"Anybody can key the information now, whereas only two people had the capability to do it under the old system," he explained.

One of the administrative functions performed by the system is, for example, central warehousing, Hicken said.

An approved warehouse requisition is processed through the CRT, requesting materials to be shipped from the districts' central warehouse. The data is received by the CPU at Central Administration and placed aside immediately for shipment or back ordered by the computer.

Twice a week or on request shipping slips are printed to pick and ship materials from the warehouse. Back orders are shipped when inventory levels permit, oldest back orders first.

The materials are printed in location sequence for ease of picking. A perpetual inventory status is maintained and available for inquiries through the CRTs.

Student data can also be processed through the CRT, bypassing keypunch.

Information available for each student through CRT inquiries at five locations include general attendance, general data, emergency, transportation, grade reporting, annual attendance and scholastic data, Hicken noted.

The communications system has eliminated the need to hire at least five additional employees and made more information available to the school administrators, he said.

The computer operation was successful because all user software was developed and maintained by Cherry Hill's two-man programming staff; changes in systems and programming were coordinated with a common plan; Univac provided software to handle user programs in communications; and department users cooperated totally, Hicken said.

SNA Designed For Future Use

(Continued from Page 26)

interfaces with a higher level function or data level which should not "suggest" how the user adapts his applications to the network, he said.

Snap is really the interface between the calling power and the data level of the protocol. On the one side typically is the user, while on the other side of the interface is the network.

In SNA documentation, the interfaces between various layers are only "functionally specified," and the actual formats and parameters are device-dependent and implementation-dependent. "It is quite different if you are using a 370X front end or if you are using a terminal controller," Rybczynski said.

But subscribers are not interested in how this implementation takes place, they are only interested in what services are being provided on the network and also what the interface is between their terminals and the network, he said.

The most important result of X-25 is that it takes packet-switching concepts out of the laboratory and makes it feasible to implement networks using standard methods, he said.

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For Firm's Six Service Centers

POS System Speeds Location of Parts for Customers

LOS ANGELES – Where does a builder turn when an integral part of a diesel engine powering grader is damaged in an accident on the job?

For Cummins Services & Sales, Inc. here, this kind of situation is one of the reasons why the firm has set up a computerized point-of-sale (POS) system to help its customers quickly find an individual part from among the more than 55,000 parts stored in its inventory.

Cummins coupled its six parts and service centers serving southern California and southern Nevada to a computer network as the initial step in simplifying customer transactions conducted on a daily basis.

The inventory control system provides up-to-date status of each part by means of Hazeltine 2000 CRTs.

Inventory information is generated from and stored in a Digital Equipment Corp. PDP-11/50 minicomputer which serves all of the company's installations.

When a part is shipped, the system produces a picking and shipping form on General Electric Co. Terminet 300 printers operating at 30 char./sec.

The firm offers this POS service to both wholesale and retail customers.

"We feel this system has been extremely helpful in getting critically needed parts directly to the customer as quickly as possible," Jim Faux, controller, said.

The cash-and-carry transaction is most common. But if the customer wishes, the part may be forwarded by mail or freight along with the paperwork, including an invoice by part number plus a packing and pick slip to validate that the correct piece was ordered and shipped, he said.

Another system benefit is its search capability, Faux said. If a particular part is not in the location where a customer request is initiated, all other locations are automatically searched by the system to locate the part.

A picking and shipping form is produced at that location and the part is then shipped to the customer.

The use of the system has been successful so far, but the firm plans to move it ahead to provide a wide array of additional services, Faux said.

"Right now we have two printers at each of our facilities. One is always in use on the ordering system. We use the other for administrative messages as a 'slave' to the CRT," he said.

The administrative printer also serves as emergency backup to the ordering system printer. It is connected to a closed communication system through the minicomputer to a message-switching computer at the Cummins factory in Columbus, Ind.

This communication system connects all of the firm's locations to all its distributors worldwide.

One of the eventual goals of the system is to provide a greater degree of autonomy to each of the Cummins facilities involved in the network. As the ultimate goal, each of the facilities would be able to operate independently of the others through the capability of handling all tasks locally via the computer network.

MVS Release 3.0 TSO Interfaced to VS/1

LONG BEACH, Calif. – Tone Software Corp. (TSC) has added Tone III, a communications software package which is said to interface VS/1 to MVS Release 3.0 of IBM's Time-Sharing Option (TSO).

The Tone III implementation of TSO does not require Tcam and is said to provide significant performance enhancements over VS/2 TSO.

The software is operational on IBM 370/135s with 384K storage through IBM 370/168s, it added.

Tone III supports the IBM 3270 local and remote modes, 2740 Model I and II, 2741s and teletypewriters under Btam. The 1052, 3210 and 3215 consoles are supported with EXCP, the vendor said.

TSC is offering a 30-day free trial period to evaluate the product. Tone III is available for $500/mo from TSC at P.O. Box 1127, Long Beach, Calif.

ASC Adds Earth Station To Satellite Network

GERMANTOWN, Md. – American Satellite Corp. (ASC) has added an earth station in Vallejo, Calif., to its satellite communications network.

The stations will serve customers in the San Francisco area. ASC also operates commercial earth stations in Los Angeles, Dallas and New York.

Satellite services including data transmission are also available in Atlanta, Chicago, Houston, Washington, D.C., and Pittsburgh, ASC said from 20300 Century Blvd., Germantown, Md. 20767.

Transcom Modem Line Offers Touch-Tone/Audio Response

WINDSOR LOCKS, Conn. – A line of Touch-Tone audio response modems has been developed by Transcom, Inc., a subsidiary of III-G, Inc.

The Audioport 400 multiple modem pack provides two-way communication between a voice- or tone-response computer and Touch-Tone terminals over voice-grade communications lines. They operate in a system similar to the equivalent Bell 401 and 403 data sets, the firm said.

Two models and several options allow the Audioport 400 to be compatible with or a replacement for Western Electric 401J and 403E or -D modems. They may receive transmission from a variety of numeric and alphanumeric Touch-Tone devices. They decode the 16 characters of the AB (2 of 8) code set and/or the 64 characters of the ABB' code set.

The chassis cost ranges from $800 to $1,150 and modems cost $460 to $485 each depending on features. The firm is at 580 Spring St., Windsor Locks, Conn. 06096.

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User Reports Terminals Service-Free for One Year

MINNEAPOLIS – A manufacturer here recently replaced some IBM terminals and printers with Genesis One equipment.

Almost a year later, no service calls have been reported on the G-77 display terminals and G-Series printers, according to Bob Sissini, manager of management systems at Thermo King, a division of Westinghouse Electric Corp.

The division, which makes mechanical refrigeration systems for trucks, trailers and rail cars, has over 30 CRTs and printers altogether.

"Economies are effected by minimizing downtime, and we have had none with the Genesis equipment. The terminal we have right on the assembly line gets just about as much abuse as a piece of equipment can get," Sissini said.

The G-77 display is a plug-compatible interchangeable replacement for the IBM 3277 Model 2 and the G-Series printer for IBM's 3284, 3286 or 3288 printers. Both connect directly to IBM's 3271/72 Model 2 control units.

Currently, a mix of IBM and Genesis One units are being used for processing customer orders and inquiries, inventory, accounting and on-line engineering systems.

Attracted by the promised economies to be gained by replacing some IBM units with Genesis One equipment, Sissini said he was convinced when the Genesis salesman walked in with the G-77 terminal and plugged it directly into the IBM controller.

Thermo King realized a 33% savings on the leasing costs. "They are indistinguishable from IBM in service," Sissini continued, "though we are not using all of the extra features the Genesis equipment provides. The printers are faster, quieter and more rugged than the IBM units."

However, Thermo King does not plan to replace all its IBM units with Genesis One gear.

Micro-Controlled Printers Added for Sycor Models

ANN ARBOR, Mich. – Sycor, Inc. has a series of microprocessor-controlled matrix printers for use on its Model 350 intelligent terminal and Sycor 250 intelligent display system. The printers were earlier introduced on the Sycor 440 clustered-terminal processing system.

The printers, which operate at 60-, 120- and 180 char./sec, use a microprocessor to control system dynamics including print head needle timing, character registration, paper acceleration profiles and adaptive print head acceleration and deceleration and to perform multiple-task processing for simultaneous data transfer, line feed, keyboard scanning and indicator drive, the firm said.

The printer series features bidirectional printing, a "look-ahead" function to optimize throughput and vertical and horizontal slewing.

Because of these developments, the Sycor 60 char./sec printer reportedly can equal the throughput of conventional 80 char./sec models; the Sycor 120 char./sec model reportedly can outperform conventional 165 char./sec printers.

The printers also feature a 12-key function pad with which users can set margin widths, forms length, vertical and horizontal tab positions and execute commands such as "top of form," as well as have dynamic forms alignment for preprinted forms.

The Model 350 printer series' prices range from $5,600 for the 60 char./sec printer and $8,620 for the Model 3618 180 char./sec printer. Delivery of the Model 350 printer series will be in June, Sycor said.

Printers in the Sycor 250 printer series are priced from $4,800 for an unbuffered Model 2606 to $8,060 for an unbuffered Model 2618 and from $6,600 to $11,830 for buffered versions of the same terminals, it said.

Delivery of the 250 printer series is scheduled for July from the firm at 100 Phoenix Drive, Ann Arbor, Mich. 48104.

ACS Unveils Watsbox For Smaller Budgets

DALLAS – Action Communication Systems, Inc. (ACS) here has added a smaller model of the Watsbox series of electronic long-distance switching systems.

The Model 50 reportedly provides significant monthly cost savings for installations with small to medium telephone budgets.

Configurations of the Model 50 provide least-cost routing and accounting data capture for all types of foreign exchange, Wats and direct distance dialing (DDD) circuits, ACS said.

Selects Least Cost Line

The system is said to analyze the desired long-distance number and select the least-cost line from all available choices. At completion of the call, the unit captures on magnetic tape information including the identity of the caller, the telephone number, the date and time of day and the duration of the call.

The customer may then process the tape to produce individual detailed bills and to analyze the exact calling patterns to optimize types of lines, it said.

Purchase prices of the Model 50 start at $70,000 for a fully configured turnkey installation, Action said from 10300 N. Central Expressway, Dallas, Texas 75231.

Westar Satellite Service Added in 11 More Cities

MAHWAH, N.J. – Western Union's Westar domestic communications satellite system now serves 20 cities.

The system has 94 city-to-city pairs of routes.

New satellite access cities which went on-line recently were: Boston; Buffalo, N.Y.; Philadelphia; Baltimore; Cleveland; Cincinnati; Detroit; St. Louis; Kansas City; Milwaukee; and Wilmington, Del.

These cities join those already on the Westar System: New York; Chicago; Washington, D.C.; Atlanta; Dallas; Los Angeles; San Francisco; Pittsburgh, Pa.; and Houston.

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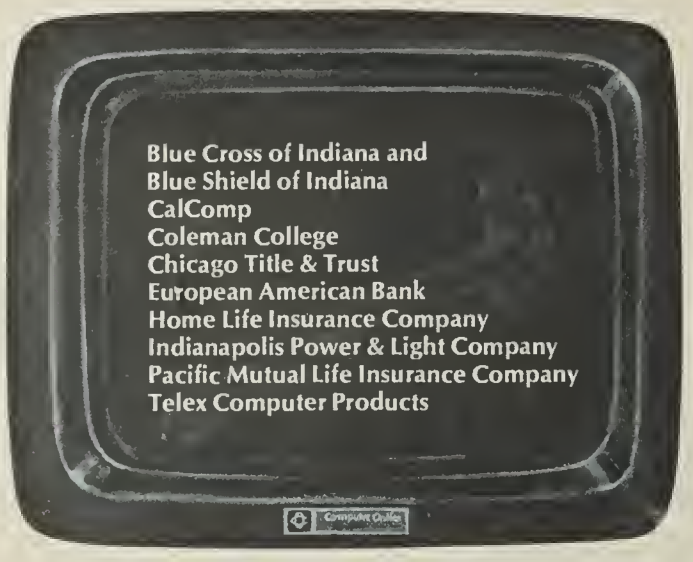

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Bits & Pieces

Ball Has Mini Disk Drive

OAKLAND, Calif. – A high-density disk storage drive for minicomputers and small computers will be introduced by Ball Computer Products, Inc. at the Computer Design Show in Chicago tomorrow.

The Ball Disk 50 (BD-50) is an IBM 3330 type (short-stack version) and offers 50M bytes of on-line capacity.

The BD-50 was designed to support file management techniques in real-time, multiterminal and batch processing systems requiring high-speed, randomly accessible mass storage, Ball said.

In quantities of 50, the unit is priced under $5,000. Ball is at 5601 College Ave., Oakland, Calif. 94618.

Tally Unveils Printer

KENT, Wash. – Tally Corp. has announced a 120-char./sec dot matrix serial printer.

The Model 1200 features an acoustically designed cover. Paper slew speed is 10 in./sec, Tally said.

An electronic vertical format unit (VFU) allows the paper format to be loaded into random-access memory with one pass of the VFU tape reader, it added.

The standard parallel interface can be replaced with optional serial interfaces. Available also are horizontal tab, switch-selectable 6- or 8 line/in. and a 96-character Ascii character set.

Unit prices for the Model 1200 start at $2,575; quantity discounts are available, Tally said from 3801 S. 180th St., Kent, Wash. 98031.

Intel Adds Chassis for IN-65

SUNNYVALE, Calif. – Intel Corp. is offering a standardized, 2M-byte chassis for its IN-65 charge-coupled device (CCD) memory system.

The IN-65 Megachassis is a high-density, solid-state memory system, the firm said. It measures 19 in. wide, 17.5 in. high and 14 in. deep.

The Megachassis houses the IN-65 system boards, which include MU-65 memory units, a CU-65 control unit and a BU-65 buffer unit.

In a configuration of 1,024K 18-bit words, the system costs approximately $40,000, Intel said. Other configurations are available.

Intel is headquartered at 1302 N. Mathilda Ave., Sunnyvale, Calif. 94086.

Tab Introduces Burster

PALO ALTO, Calif. – Tab Products Co. has introduced a multipart burster.

The 2740 series operates at speeds from 15- to 350 ft/min and prices range from $1,995 to $2,995. The firm is at 2690 Hanover St., Palo Alto, Calif. 94304.

With Expertise Available Today

Mistakes in Selecting Gear Avoidable

By Toni Wiseman
Of the CW Staff

DETROIT – The proposals emanating from the computer experts when computers were first introduced were, at best, good science fiction – and early users paid dearly for their folly, according to C.G. Weitzmann of Parke-Davis.

With all the expertise around today – both at the vendors' organizations and at the users' – there is no excuse for an incorrect selection of equipment or bad estimate of cost, Weitzmann told a Computer Caravan session here recently.

"However, keeping pace with developments in technology and equipment is a difficult problem," he stated. "Compounding this problem is the lack of one source for this information.

"The individual user is outnumbered by hardware, software and DP service vendors vying for his order by about 2,000 to 1."

Close the Door

An open-door policy for vendors at the user location is highly impractical, and sales visits from vendors other than those of present equipment should be limited to major announcements and specially arranged appointments, he said.

To keep up to date with new announcements and trends in DP, Weitzmann suggested publications such as *Computerworld*, *Datamation* and *Infosystems*, reports published by Auerbach and Datapro, seminars, user associations and DP societies.

"By use of this broad base of information, it should be possible to identify developments useful at your installation and determine areas of study and equipment to be evaluated," he said.

To Stay or Go?

When acquiring peripherals, the user must decide either to stay with his mainframe manufacturer or go to an independent. There are advantages to both courses of action, according to Weitzmann.

The pros of staying with one vendor include the value of a one-vendor relationship, maintenance and support. Leverage (which can be used to obtain attention and support) and equipment compatibility are other advantages.

In addition, mainframe manufacturers are often first with major technological changes, he said.

Advantages offered by the independents may include lower cost, extended functions and capabilities, improved performance and favorable contract terms.

"Each situation is different in terms of the equipment that can perform the job

(Continued on Page 32)

Success of DP Department Seen Depending on User Relations

By Molly Upton
Of the CW Staff

DETROIT – The success of a DP department depends on its relations with the user departments, Edward W. Oljace, manager of DP operations at Borman's, Inc. recently told a Computer Caravan forum here on "Computerizing Small Organizations."

"Our biggest asset is that we took time to sell DP to the division vice-president and the rest of the company," Oljace said.

As evidence of the DP department's belief that it should be of service to the rest of the firm, the department has grown along with the diversified firm, which had sales of $499 million in 1974 and over $570 million in 1975.

"I like to think DP had something to do with this growth," he remarked.

As a corollary, the department is always trying to do the job better for less cost, he said.

Although the workload has increased over the years, the department cut back from using an IBM 360/40 and 30 to just the 40. It owns both machines, which it procured years ago from a third-party user, as well as most of the other equipment. But the 30 is used only for outside work, generating revenues, he said.

Borman's DP shop runs 24 hours a day, five days a week, and eight hours on Saturdays and Sundays.

Oljace uses a service bureau to assist with peak load work, such as keypunching twice a week, and has also used consultants at various times to assist in developing solutions for certain departments. However, he does not like to contract out for programs.

The firm believes in promoting from within, and the average DP employee at Borman's has been with the firm eight years, Oljace said. He rotates people between shifts and tasks to give variety.

As an example of in-house training and promotion, he said, a former stock clerk is now the firm's software specialist.

Computer operators tend to make good systems personnel, he said, since "they've taken the knocks out on the floor because some programmer decides to use several

(Continued on Page 32)

CDC 75 In./Sec Tape Equipment Costs 38% Less Than IBM Models

MINNEAPOLIS – A magnetic tape system that is said to allow users of IBM 2400 and 3410 tape equipment to add 75 in./sec speed capability and achieve up to 38% cost and 66% space savings has been announced by Control Data Corp. (CDC).

The 34201-3 connects to IBM 360/30 through-65 and 370/135 through -155 computers. It incorporates two 9-track drives and a microprogrammed controller in a single cabinet and can be expanded to six drives per controller.

Microprogramming allows users to perform system diagnostics either on- or off-line, the company said. This eliminates use of the central computer to perform these functions, CDC added.

Drive units record in industry standard, 9-track, 800- or 1,600 bit/in. modes. IBM-compatible formats allow tape reel interchangeability and full media compatibility, CDC said.

The basic two-drive, single controller CDC 34201-3 is priced at $36,860 for purchase or at $970/mo on a three-year lease. Maintenance is available for $195/mo.

First customer deliveries of the system will begin this month, CDC said from Box 0, Minneapolis, Minn. 55440.

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Service to Firm Seen Function

Success of DP Center Depends on Relations With Users

(Continued from Page 31)

packs on one job," he said.

Borman's 360/40 has 256K and 128K dedicated to on-line CICS. The firm has businesses in eight different areas ranging from food stores and dairies to pharmacies and photo stores.

Five years ago, when it had trouble with throughput, it installed the IBM DOS Private Library System Version III, which enables programs to be self-relocatable rather than running only in foreground or background partitions, he said.

The department tries to write each program to run in 56K or less, he said. The principal language is BAL, with Cobol the second language.

Since one chain of stores needed 24-hour turnaround, the firm put in Qtam and teletypewriters to take orders from the stores.

The orders are pulled at around 5 p.m., the bills are processed by 10 p.m. and the warehouse starts picking at 9 p.m., he said. This eliminates excess inventory, he observed.

Printer Cuts Report Time

With a Xerox 1200 printer, the department can put out reports in 12 minutes that formerly took two-and-a-half hours, he said. The savings are realized in CPU time, since the unit runs off-line from a magnetic tape, and in paper forms, he said.

The 1200, through the use of overlays which cost about $120 each, creates the forms. A box of paper costs $3.60 for 1,000 sheets compared with one form that was costing $62.85 per 1,000, he said.

"Everyone has an original and thinks he's going first class," he said.

Also, reports can be re-created without tying up the CPU, he said. When Borman's started acquiring dairies at a rapid rate, the department expanded its file capacity with IBM 2314 disk drives, but the paperwork on deliveries was getting bogged down in the keypunch department.

A 12-hour turnaround time was needed on the drivers' reports of deliveries. Oljace called in a forms company which developed a turnaround ticket for optical character recognition (OCR).

Oljace bought an IBM 1287 scanner which, he said, eliminated four keypunch operators. The system rejects fewer than 10% of tickets that are filled in by the drivers, he said.

Borman's next adopted the use of an OCR cash ticket, which saves 12 hours of keypunching, he said.

To facilitate finding data in bulky reports and to alleviate the printing workload, the firm uses a service bureau to process a magnetic tape it provides.

Borman's also uses a service bureau two days a week for keypunching claims for its drug stores. The quick turnaround is needed to provide cash flow in this area, he said.

The shop also uses IBM 3277 CRTs with light pens to input prescriptions for its unit that supplies nursing homes. This has eliminated all keypunching for this application, he said.

The DP department bills the user departments according to the materials used, such as paychecks and forms.

"We established what we thought a fair rate, $40/hour for CPU time," and the average cost of keypunching and other services, he said, then took the monthly cost of operating the shop and arrived at rates to charge the users.

But he admitted he has a problem trying to figure out a rate for the on-line service. If he charged at the hourly rate, it would annihilate that division, he said.

Expertise Helps Users Avoid Many Mistakes In Selecting Gear

(Continued from Page 31)

and the economics and other factors involved. Each installation is different in its approach in evaluating equipment," he said.

Evaluating Equipment

In conducting an equipment evaluation, the user should plan each equipment study by defining objectives, levels of equipment and systems to be considered, Weitzmann suggested.

Next, alternatives should be considered since new and more powerful equipment is not always the answer, he noted.

The number of vendors and units of equipment in the study should be narrowed as early in the study as possible, he cautioned.

In publishing requests for proposals, the vendor specifications should be as descriptive as possible, but should also be broad enough to allow the vendors some latitude in making proposals, he said.

"Challenge each proposal in terms of operational, technical and economic feasibility," Weitzmann said. "You should also survey current users of each type of equipment on performance and the service record of the various vendors."

He also suggested checking Dun & Bradstreet for ratings of smaller companies.

Expand Study

After the user selects the equipment and vendor which best meets his requirements, the study of the selected alternative should be expanded, including benchmarks or trial use at another installation.

This expanded study should include an estimate of the costs of conversion, parallel testing, training, supplies, etc.

Finally, a study report and recommendation should be drawn up in accordance with the standards of the individual installation. The report should include approval signatures of key users, including the data center operations manager, Weitzmann said.

If there are financial alternatives yet to be considered (purchase, lease or rental), this should also be clearly expressed in the report as well as some estimate of the time required for this analysis, he added.

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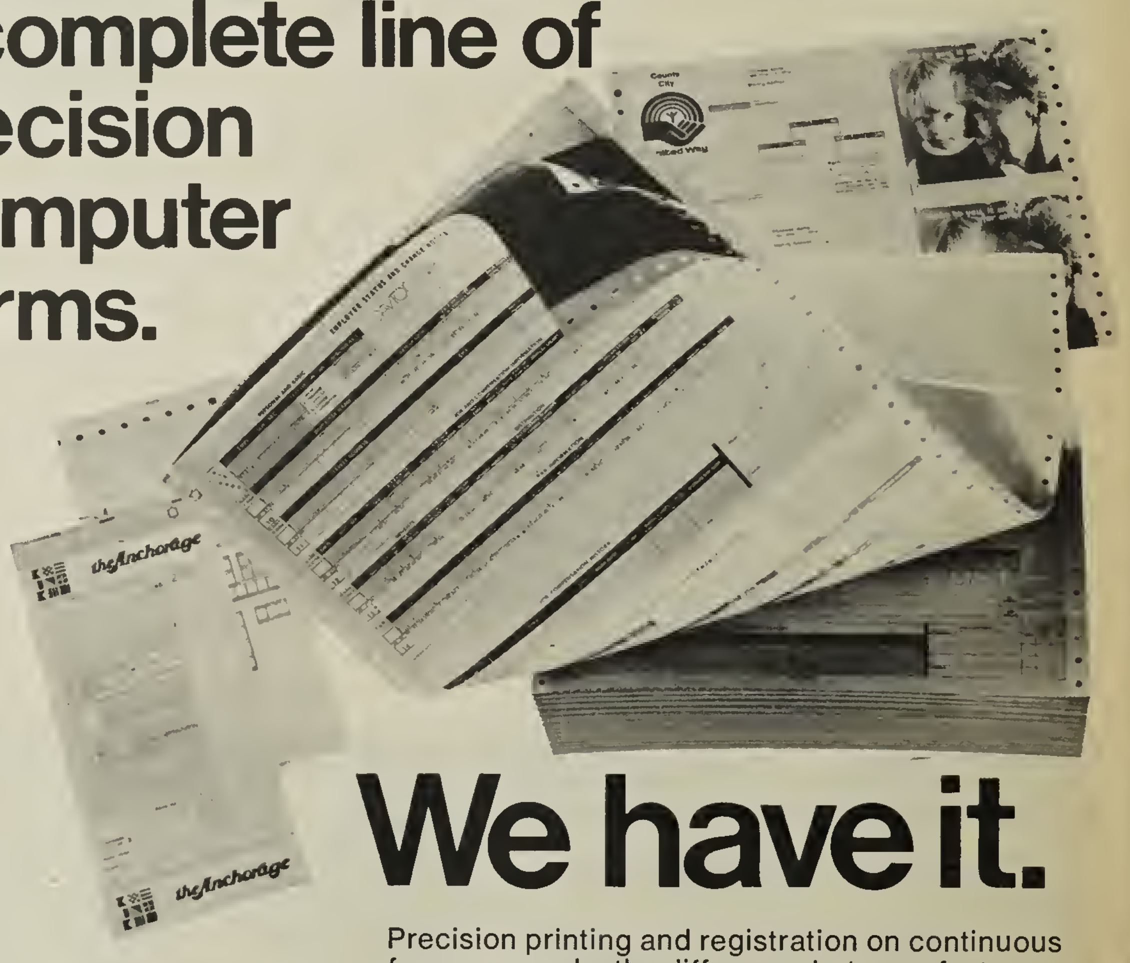

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Planning Eases Move for $5 Million Data Center

BURLINGTON, Mass. What's involved in moving a large data center with a minimum of disruptions?

The Wang Data Center, a division of Wang Laboratories, Inc., recently found out when it relocated its service bureau from Arlington, Mass., to a new facility here.

During a 29-hour span, the data center moved over 80 pieces of hardware valued at $5 million, including an IBM 370/158, control units, 30 disk drives, 15 tape drives, card readers and punches, a Honeywell DDP-116 and various peripherals, in addition to the entire office contents and personnel for three large customers located in the data center premises and the Wang Data Center personnel.

In that time, cables were unhooked, moved, relayed and reconnected; diagnostics were run; a backup gas turbine generator and environment control units were moved and reinstalled; 200 teleprocessing lines moved and tested, and a 15,000-volume tape library was relocated and reassembled.

"The important thing for us was to make the move virtually transparent to our customers – as a professional service bureau, they expect nothing else and we had to deliver," according to Kevin C. Sweeney, data center manager.

Since 1965, the data center – operating in an Arlington warehouse – experienced steady growth, moving through an IBM 360/50, IBM 360/65 and IBM 370/158. The Wang data center was the first computer service bureau facility to upgrade its operating system to VS in the New England area, Sweeney said.

Many factors unique to a computer installation had to be evaluated before purchasing the Burlington site. Confirmation was obtained from the electric company regarding the voltage regulation, since voltage fluctuations and power surges could affect the reliability of the computer operation.

Second, because of the teleprocessing services offered by the data center requiring special telephone switching equipment, the telephone company was contacted well in advance to ensure that Wang's teleprocessing services would not be hindered and could be serviced well into the future growth curve.

Thirdly, the surrounding area of the proposed site was inspected to ensure that electrical interference would not cause problems with telecommunications or CPU processing.

Because a local radio station's antennae were located in proximity to the proposed site, IBM brought in a team of specialists to monitor the effect on the proposed site. The IBM specialists sanctioned the new site, but suggested the computer be located away from the wall nearest the antennae to ensure noninterference.

"Thorough planning and continual, day-to-day communications with all parties involved, especially the New England Telephone Co., in light our our heavy dependency on teleprocessing" were the most important considerations to George Mahoney, manager of hardware planning.

Six Months of Planning

Although the move took place overnight, the actual planning occurred over a six month period. "We tried to plan for every possible occurrence, anything that might go wrong – from the accidental setting off of a sprinkler head by one of the movers to the possible hijacking of the CPU," Mahoney said.

Sheila Salter, the relocation coordinator, divided the basic relocation activities into seven categories: customer notification, vendor notification, physical planning and preparation, teleprocessing, backup facilities, move arrangements and the critical-path move-day schedule.

All Wang Data Center vendors were notified as soon as the move date had been finalized. Arrangements were made with field engineering departments and physical planning people for a complete evaluation of the new facility, and each prepared a list of their requirements for the new location.

Physical planning included floor plans which were laboriously discussed and redrawn in order to provide the best working environment and traffic pattern for all personnel.

It was decided to locate the computer room in the middle of the building on the first floor in proximity to the loading ramps, stock storage areas and tape library.

The 250-kilowatt gas turbine generator for emergency power generation was moved from the Arlington facility to the new location one week before the move.

The cabling from the generator into the computer room was checked for correct phase rotation, and all 110 outlets utilized by the computer room equipment were given special identity markings. All machines and outlets were marked with the cabinet and circuit breaker numbers from which they obtained power.

Because of the sensititivy of the hardware cabling for the CPU, controllers, tape and disk drives, existing cabling was moved to Burlington on the day of the move to ensure the compatibility of the cable connectors.

The most critical concern of the relocation crew was the installation of the 200 teleprocessing lines in the Burlington facility. While the New England Telephone Co. submitted day-to-day progress reports, the data center made continual checks on the line installation and testing of varying speed lines, reporting its results to the telephone company.

Since thorough testing of the modems, speed and protocol of the lines could not guarantee problem-free initial operation, Wang anticipated delays in setting up the teleprocessing network.

However, because of the New England Telephone Co. and AT&T's work in the network engineering and installation, the teleprocessing lines were all fully operational two days after the move.

In scheduling the critical path, the most important processing-dependent equipment was to be moved first. During the duration of the move, the sprinkler systems were shut off in both Arlington and Burlington.

Since the insurance coverage limited the equipment which could be moved on each truck, a mix of equipment was selected for each one of the trucks.

To ensure the safety of the VS-2 operating disk packs and all backup tapes and disks, the systems programming staff hand carried those items to the new location in separate vehicles.

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Automated Files Give Church Control of Mailing Lists

BEAUMONT, Texas – The Victory Assembly Church here has streamlined its international multimedia ministerial program, International Voice of Victory, with a disk-based file maintenance system expected to pay for itself within six months.

International Voice of Victory, the church's radio and television outreach program, now has control over its 80,000-name mailing list for the first time.

According to Victory Assembly's business manager, Larry E. Clendennen, the Inforex, Inc. 5000 system has allowed the church to eliminate "thousands" of duplications on that mailing list while lowering costs at the same time.

The system, which includes a 200 line/min printer, can automatically print labels used in shipping religious material, he explained. It can also print order receipts and receipts for donations received as well as type Victory Assembly's responses to written requests for prayer.

Used Service Bureaus

Victory Assembly had used two service bureaus for the three years before it leased the file management system. One service bureau maintained the church's mailing list and prepared labels in Cheshire machine format for the magazine the church mails each month, but Clendennen's staff had to individually type each shipping label, each receipt and each response to a prayer request.

"We were paying for what we weren't getting," Clendennen said. He estimated the church spent about $70,000 for the mailing list service alone in the 14 months before the disk-based system arrived.

"We weren't computer programmers and, like many organizations, we didn't have a lot of money to hire programmers," Clendennen said. "Also, we had looked at some IBM equipment, including its 3, but we couldn't really see how that would help us. It really seemed that we would have to adjust to that system, while the Inforex system adjusts to us."

The Inforex system leases for $3,393/mo with maintenance and includes a control unit with 64K bytes of core memory; two 9-track, 800 bit/in. tape drives; two 25M byte disk drives; four CRT terminals; four serial printers; and a 200 line/min printer.

Clendennen estimated the system will pay for itself within six months in savings over service bureau costs but, he added, the improvement in control over the church's operations would be even more important.

"Every day, we're coming up with new ways of using the system," he said. In addition to maintaining the master mailing list and preparing shipping labels, receipts and prayer letter responses, he explained, the system will also prepare labels in Cheshire machine format for the monthly mailing of church publications.

The system is also used to keep track of contributions from members of the Victory Assembly of God congregation by updating the contributors' master records and maintaining a year-to-date total of each member's donations. The system will produce receipts for tax purposes for each member at the end of the year.

The system required no special operator training, Clendennen said. He personally has created many of the file formats for Victory Assembly's variety of applications.

Those applications begin with the master file of 80,000 names of people who have made donations, ordered religious material or requested prayer.

Each name in the file is identified with an alphanumeric code consisting of the Zip Code, the first four letters in the last name and the first three characters in the address. "Typing that code into the system calls the name out of the file stores on disk, or we can create a new record for that person," Clendennen explained.

He said the system will store responses to four kinds of prayer request letters: requests which include money and those which do not, requests which include money and also request prayer cloths and those which do not include money but do request prayer cloths.

"The only differences among the letters are that if money is enclosed, the system will type a 'thank you.' If prayer cloths are requested, the system will type 'enclosures,'" said Clendennen.

"The system operator who opens a prayer request simply types in the code for the appropriate letter and transfers to the letter file. The letter is subsequently printed on the terminal printer."

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Mini Bits

DEC Increases Prices

MAYNARD, Mass. – Digital Equipment Corp. has announced a 3% to 4% price increase on selected older products, a spokesman said.

Among the affected products are the PDP-11/05, PDP-11/40 processors, the TU16 tape unit, RX family of disks and the GT40 graphics terminal, a spokesman said. The increases apply to all orders written or quoted after March 27.

The increases are primarily because of costs of labor and material, a spokesman said. The products affected are ones for which the company has introduced more cost-effective replacements, he added.

HIS to Hold Mini Conference

BOSTON – Honeywell Information Systems (HIS) will hold a minicomputer conference Thursday, April 22, and Friday, April 23, at the Sheraton-Boston Hotel here.

The conference, called Minisystem '76 will feature presentations of technical papers by HIS customers, engineers and systems representatives on minicomputer applications and design.

Demonstrations and workshops on the company's Level 6 Model 6/06 and 6/36 minis also will run concurrently with the conference.

The conference costs $50 and includes two luncheons, a reception Thursday evening, a conference kit and one bound copy of the proceedings.

Information is available from the arrangements chairman at HIS, 200 Smith St. M.S. 492, Waltham, Mass. 02154.

Sessions Aimed at Hobbyists

DENVER – The American Radio Relay League is sponsoring two concurrent technical sessions on micro technology to beginners and advanced hobbyists at its annual convention here July 16.

Information is available from 13640 E. Center Ave., Aurora, Colo. 80012.

Information Service Available

MENLO PARK, Calif. – Dataquest, Inc.'s Minicomputer Industry Service provides in updated notebooks an analysis of industry structure, technological considerations, products, five-year market forecasts and competitive considerations, the firm said.

Part of the service includes free inquiry privileges for answering questions or providing backup information an an annual two-day seminar featuring industry speakers, a spokesman said.

The service costs $6,500 annually from the firm at 3000 Sand Hill Road, Menlo Park, Calif. 94025.

Selecting a Mini—Part 1

Specification Helps to Evaluate Bids

This is the first of a series of articles dealing with the selection and evaluation of business minicomputer systems. This article covers developing a specification.

By Robert E. Berkman
Special to Computerworld

While it seems that the cost of everything we buy is going up, minicomputer prices keep coming down.

New technologies have reduced the cost of minicomputers to the point where in-house computers are cost-justifiable for many companies that could not justify them previously.

In addition, mini manufacturers and system suppliers have put together systems that are "independent of professionals." This means that companies do not need a staff of computer professionals to operate the system.

These factors have caused more small businessmen to look to business computer systems to stabilize staff sizes and gain greater control over the facets of their business.

The company executive is surrounded with information about computer systems. He reads about them in books and periodicals, sees them in trade shows and hears about them from friends and business contacts.

In addition, he is probably contacted on a regular basis by manufacturers and turnkey-vendors who offer business-oriented systems.

It appears to be difficult for the executive to make a realistic evaluation of the systems presented either from a cost or performance basis. This is compounded by the technical jargon he hears and the mystique the computer people have built around themselves.

In reality, selecting a business computer system is not unlike other business decisions. There is a logical series of steps one must go through and questions that must be answered before making the decision.

When a company is ready to take a serious look at computers, the firm should start by developing a functional specification. The specification accomplishes two purposes.

First, it provides a uniform, unbiased basis for soliciting bids for the system. In essence, it tells the vendors what is wanted rather than allowing them to tell the firm what they think the firm should have.

Second, it provides a method of quantifying the benefits that will be derived from the installation of the system. Professional assistance from an unbiased and informed source should be used to create the functional specification.

A functional specification should contain several elements if it is to be effective.

Review Procedures

In order to effectively automate, one must first have a thorough understanding of what is currently being done. A review is made of all the procedures that are now used to run the organization. This includes following the paper flow within a department and the interfaces between departments.

It is important to talk to the people who are actually doing the work. Management often knows what is done in a department, but not how it is done.

In doing this work, transaction volumes should be gathered and an estimated personnel utilization by function developed.

Management should have objectives in mind for putting in a computer system. Quite often these objectives center around getting information they are now not able to receive or getting information in a more timely fashion.

These objectives should be discussed in detail and levels of importance established. This is an important step since a trade-off analysis should later be done to

(Continued on Page 37)

Telephone Call to Operator Registers Students at College

By Esther Surden
Of the CW Staff

JOLIET, Ill. – When a full-time student at a junior college here registers for classes, the student's advisor picks up the phone and calls an operator at a CRT supported by a minicomputer.

The operator enters each of the course selections into the system, verifying that space is available in the class, no time conflict exists and that the student has the required labs and discussion groups for certain courses, Ronald Breed, director of data processing of Joliet Junior College, said.

Also verified is the student's address and residency information. When all the information is complete, the student is registered and will receive his schedule through the mail, he added.

The minicomputer involved is a Four-Phase Systems, Inc. small business system. In conjunction with an NCR Corp. Century 101, the system serves the college's DP needs.

The 101 batch system purchased in December of 1973 is used for educational, batch and long print jobs, Breed continued, while the Four-Phase system is used for on-line processing of student records, payroll, personnel and accounting.

The configuration at Joliet includes a Four-Phase Model 70 with 96K of memory, two 50M-byte disks, one 300 card/min reader, a 300 line/min printer, one magnetic tape drive and 19 CRTs.

The NCR 101 has 48K of memory, four 5M-byte disks, one 1,100 line/min printer, a card reader and magnetic tape drive, he added.

The Four-Phase system was installed in November and five days later on-line registration began, Breed noted. Midwest Systems Group, Inc. (MSG) was responsible for the on-line programming, he added. The 101 was programmed by the college's in-house staff.

Data communications between the two minis was also established via a short-distance modem, Breed said, so all existing programs for the NCR CPU can still be run.

By purchasing both the hardware and software with a five-year payback, the cost per month is under $2,900 for the

(Continued on Page 36)

Controller Handles Four Densities

ANAHEIM, Calif. – The Model 5191 Quad-Density magnetic tape controller from Datum, Inc. is capable of handling four separate data densities with a single controller, according to the firm.

The controllers are hardware- and software-compatible with minis from Computer Automation, Inc.; Data General Corp.; Rolm; Digital Computer Controls; Digital Equipment Corp.; Hewlett-Packard; Varian Data Machines; Interdata, Inc.; and Lockheed Systems Corp., the firm said.

The 5191 has individually driven ports for up to four transports in any combination of 7 or 9 tracks, NRZ or phase-encoded data densities from 200- to 1,600 bit/in. and tape speeds from 12.5- to 200 in./sec, Datum said.

The unit has separate, parallel outputs for each drive, allowing a mix of different tapes on one formatter, Datum said.

The 5191 costs from $5,400, depending on minicomputer and cabling options, the firm said from 1363 S. State College Blvd., Anaheim, Calif. 92806.

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Telephoning Operator Registers Students at College

(Continued from Page 35)

Four-Phase mini, according to Breed. The 101 bought earlier at a payback of $3,000/mo. With all maintenance and software costs included, total cost is $6,800/mo, he said.

Considered Upgrading

The college examined other minicomputers and considered upgrading the NCR system before settling on the Four-Phase. The price and the fact that the systems were being OEMed by MSG, a firm the college had previously dealt with and found reliable, sold the school on the system.

Breed also visited other college installations with the Four-Phase system and was impressed by the cost/performance ratio and the applications being performed by the mini, he said.

For example, a part-time student merely has to pick up his home phone and call the college to be registered, he said. Later, the school mails him a schedule with the billing information on it. To be completely registered, the student returns the schedule with a payment enclosed.

Financial collection is also done through a terminal verifying the exact amount of money the student owes the school. Financial aid such as state scholarships and local loans are entered into the system prior to the time the student pays his bill. The amount of money paid is also entered into the system, he added.

The college has been adopting a flexible scheduling policy, Breed explained, with many classes beginning at various times during the year, so the system is continuously on-line.

The student financial system is also integrated with the registration system, according to Breech, providing a complete on-line receivable ledger for each student.

The ledger also contains payments made directly to the bookstore for expenses which are included in financial aid. Payments made directly to the student for boarding, meals, transportation and miscellaneous expenses are also recorded by the system, he added.

The system also handles the college's accounting, including purchase orders, invoices, receipts, budgets, transfers and all debits and credits required, Breed noted.

A key feature of the accounting system is that the status of a particular budget is known in a real-time mode, he added.

Purchased orders and other financial transactions cannot be issued if that particular budget account does not have sufficient funds, a control feature the college finds useful in maintaining a balanced budget, he said.

Joliet has put both its inventory and payroll on-line as well. The payroll system accommodates pay cycles ranging from once a week to any other period the institution may desire.

With the inventory system, records on all college equipment and furniture are maintained. Listings are kept by department and equipment category with the on-line ability to add or update the data base, Breed said.

School Buys Unit From Independent

LOS ANGELES – A user of an independent supplier's printer on a Basic Four Corp. business machine said it's too early to tell if her decision was the correct one.

Yvonne Dettloff, vice-president of Sawyer Business College here, said, "I expected there would be no trouble with the printer in the first year of operation; we had no trouble with the Basic Four system until after 36 months of operation."

Unhappy With Service

The college bought the printer in January for four-year-old system because Dettloff was dissatisifed with Sorbus, Inc. service on the system.

"Apparently there is a lack of communications between Sorbus and Basic Four," she said, adding that Sorbus seemed to have a great deal of trouble getting parts for her computer from Basic Four.

Sorbus also sent people out to fix the mini who didn't appear to know what they were doing, Dettloff said. Downtime on the Basic Four system has been what she termed "excessive" during the last year.

Used for Accounting

The configuration at the college includes a 24K Basic Four mini with one extra disk drive, two video displays and one printer, Dettloff said. The machine is used for basic accounting functions at the school and is run by several employees.

"I went to Southwest Data Systems for the printer because the one provided by Basic four was much too expensive, and the Southwest price was right," she added.

All the independent supplier did was provide the college with a printer; there is no service contract attached to the sale. Right now, "I am just praying that it doesn't break down," Dettloff said.

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All three systems include a console CRT, 300CPM card reader, 300LPM line printer, plus emulators for IBM 2780/3780 and CDC 200UT terminals. Univac 1004 and HASP Workstation emulators are also available. Peripheral options include mag tape units and faster printers or card readers.

Mini Maintains Balanced Inventory for Manufacturer

ITASCA, Ill. – When a manufacturer of electrical coil-winding machines with an inventory of some 14,500 items decided it needed on-line inventory control, the firm selected a minicomputer to do the job.

Maintaining a balanced inventory was one of the goals of Eugene Bachi, treasurer of Bachi, Inc. A well-stocked inventory is important not only to keep the production level in line with customer activity, but also so that the necessary parts will be ready for use when needed, he said.

The firm considered four or five minicomputer manufacturers, including Varian and Hewlett-Packard, before deciding on a Microdata Corp. Reality system, Bachi said.

Bachi saw the Reality at the National Computer Conference in Chicago in 1973, he said. He was looking for an on-line system.

The ability to operate a number of programs simultaneously was another feature he felt was mandatory.

"I purposely made a trip to the Microdata plant to satisfy myself about the backup for Reality," he added.

Bachi purchased the system from Systems Management, Inc. (SMI) in Chicago, distributors for Reality. The installation process was as smooth as promised, Bachi said, and he's satisfied with the service he's gotten both from SMI and Microdata.

The system was originally installed in March of 1975 with 16K of core, one CRT, 10M bits of disk, a 300 line/min printer and cost about $46,000.

The system has since been upgraded to include an additional 16K of core, 10M-byte disk, three additional CRTs and an 800 bit/in. disk. Bachi estimated the entire cost to be about $75,000.

Inventory control, purchase ordering and payroll are all working on the system now, with four more applications to be installed shortly. These include general ledger, accounts receivable, accounts payable and cost control.

The cost-control feature will give the actual cost of a part, breaking it down into labor, materials and overhead charges as well as comparing the current cost with the previous one.

With this application, all completed job orders and invoices can be reviewed so that an immediate comparison with previous costs can be made, he said.

Specification Aids In Evaluation Of System Bids

(Continued from Page 35)

determine exactly what should be included as part of the computer system.

The way the computer will be used to handle the informational needs of the organization should be described in the system description. The description is usually segmented by application.

It shows what data is input into the system, what outputs (reports, documents; lists and file updates) are produced and what file information is needed to support this processing.

It is during the system description that determinations are made on what should be handled by the system and what should not. Often companies will attempt to automate everything, even events that happen once a year.

Care should be taken to keep the system as simple as possible while handling all major requirements. Before including a function, an analysis should be made on the costs and complexity added by its inclusion.

The system concept should identify the inputs, outputs and files that are required. Inputs should be identified by type and volume. Outputs should be identified by their frequency, volume and content.

Files should be defined in terms of their size and content. Growth percentages should be incorporated to determine long-range requirements.

System Concept

The system concept describes the nature of the computer system that will be installed and describes such things as whether the system will be batch or on-line, methods of data entry, types of storage media required, etc.

Based on the requirements defined previously, it should be possible to specify minimum hardware requirements. The number and type of input devices, the number and speed of printers, the media and capacity for data storage, the core requirements and any other special peripheral devices should be established.

With the functional specification in hand, the corporate executive should be able to determine the potential value of a computer system and to solicit and evaluate the proposals in an objective fashion.

Berkman is president of Robert E. Berkman Associates, a Ridgewood, N.J. consulting firm specializing in the selection and installation of small business systems.

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Minuteman Has Three Turnkey Systems Based on DG Nova 2/10 and 2/4 Units

WALTHAM, Mass. – The Minuteman Computer Corp. 1774, 1775 and 1776 are turnkey business minicomputers based on Data General Corp. (DG) Nova 2/10 and Nova 2/4 processors.

The systems, which are sold through distributors, use Minuteman proprietary software and a special language which is a high-level development of DG's Assembly Language.

The systems support Diablo cartridge disk drives, Centronics Data Computer Corp. and Data Products printers and Infoton CRTs. Minuteman manufactures its own controllers and interfaces, a spokesman said.

The Minuteman 1774 with 16K bytes of memory, a 5M-byte disk, printer and CRT in a single user configuration costs $34,995 or $822/mo for a 66-month lease. Maintenance would cost $235.

The 1775 can be expanded to a multiuser configuration; the basic hardware is the same as the 1774. The system costs $36,995, leases for $870/mo with $248 monthly maintenance charge.

The Minuteman 1776 with multiple user capability and 32K of core costs $39,995 or $940/mo with a $268/mo maintenance charge, the firm said from P.O. Box 31, Waltham, Mass. 02154.

Survey of Mini Users Planned

CHERRY HILL, N.J. – Management Information Corp. (MIC) is preparing a second annual survey of user ratings of small business computer systems, the firm said.

Last year's survey covered 192 small business computers from 99 users, 64 independently manufactured peripherals with 189 units and 30 independent software companies.

Ratings were given on a scale of 1 to 4, with 1 poor and 4 excellent. Respondees were asked to rate their business minis, peripherals and packaged software suppliers with respect to performance, reliability, maintainability, service and manufacturer support.

Information was consolidated and averaged for the results, MIC said.

Users and user groups who desire to participate in this year's study may obtain evaluation questionnaires from the firm at 140 Barclay Center, Cherry Hill, N.J. 08034.

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Familiar-looking forms stop mistakes; cut down on time wasted as operators try to decide what goes where.

Then, from the same keyboard, add in protected fields as further assurance that the right information won't wind up in the wrong places.

For still greater operator convenience, you may want to lock in form headings – while the data under them is continuously updated and transmitted to the computer. Or use inverse video, optional half-brightness, underline, or even blinking characters to clarify where information goes and what musn't be forgotten.

The Hewlett-Packard 2640 terminal series offers, in addition, powerful local editing and formatting capabilities. Modular design. Built-in self-test. An unusually readable display. Optional character fonts (you can even design your own). Or, choose the 2644A Mini DataStation for the same features in a terminal with mass storage capability for stand alone operation and the convenience of two 110,000 byte, pocket-sized data cartridges.

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Data Recorders For Use On-Line

HORSHAM, Pa. – Decision Data Computer Corp. has two 96-column data recorders for use on-line to the IBM 7.

The attachment Feature SP56 connects either of the two recorders to the 7 and is optional.

The 9610 interpreting data recorder or the 9660 sorting data recorder provide dual-file card reading and punching capabilities, Decision Data said.

Off-line auxiliary functions include reproducing, sorting, interpreting and gangpunching. No programming is required to implement existing card applications designed originally for the IBM 5496, the firm said.

The recorders range in price from $202/mo to $236/mo depending upon the term of the rental agreement, the company said. Users can purchase the recorder and the attachment for $8,500 with monthly maintenance of $73 from the firm at 100 Witmer Road, Horsham, Pa. 19044.

AID Model Supports Up to Eight Users

LOS ALTOS, Calif. – The AID System 300/Model 30 from Advanced Information Design (AID) is an interactive mini system that supports up to eight simultaneous users, the firm said.

Designed for business, data base and time-sharing applications, the basic system includes a 16-bit Interdata 7/16 processor with 32K core memory, 9,600 bit/sec CRT console, dual disk drive and software.

The unit is field-expandable to 65K and can accommodate eight terminals and eight disk drives, the firm said.

Software for the system includes a multiterminal operating system (MUX) with Virtual Basic Language, AID said. A word processing/file editor package is included, it added.

The system costs $16,900 or leases for $296/mo from the firm at 745 Distel Drive, Los Altos, Calif. 94022.

CCC Has IBM 3 Lease

DALLAS, Texas Computer Clearing Corp. (CCC) is offering IBM 3 users a 48-month lease at a rate equal to 74% of IBM's current Monthly Availability Charge, the firm said.

Information is available from the firm at 5025 N. Central Expressway, Suite 3046, Dallas, Texas 75205.

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For those who need more than a chip, there's the microNOVA computer-on-a-board. A complete, fully-buffered microcomputer that comes with 2K or 4K words of RAM on a single 7½″ by 9½″ board. You can add on more RAM in either 4K or 8K increments, or PROM boards with up to 4K words. Plus terminal interfaces, general purpose interfacing boards, card frame, power supply and PROM burner.

And for those who need more than a board, there's a fully-packaged 4K word MOS microNOVA mini. It comes with power supply and turnkey console. In 9 and 18 slot versions. Into which you can place as much as 32K words of RAM or PROM. And still have plenty of room left over for I/O.

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Micro Products

Comes on Circuit Board

Fairchild Releases Microprocessor Design Kit

SAN JOSE, Calif. – The Microsystems Division of Fairchild Camera & Instrument Corp. has introduced a microprocessor design kit on an assembled circuit board with a connecting cable for power supply and teletypewriter terminal hookup, a spokesman said.

The F8 kit contains an assembled and tested circuit board with Fairchild's 3850 F8 CPU circuit, the 3851 program storage unit circuit, the 3853 static memory interface circuit and eight 2102 static random-access memories (RAM), the firm said.

The kit also includes a wired edge-connector cable to connect the microprocessor to a standard teletypwriter terminal and a power supply, Fairchild said.

The board is a complete microprocessor system with CPU, memory, 32 I/O bits, two levels of interrupts and all the necessary control circuits, a spokesman said. No assembly or soldering is required, Fairchild said.

The F8 kit costs $185 from the firm at 1725 Technology Drive, San Jose, Calif. 95110.

OEM Micro Cards Available

SANTA CLARA, Calif. – A series of OEM microcomputer cards is available from Microcomputer Associates, Inc. here.

The series consists of four cards, each based around different microprocessors, the Intel 8080A, the MOS Technology, Inc. 6502, the Motorola, Inc. 6800 and the Signetics 2650.

Each card contains a crystal-controlled clock, 1K of 8-bit static random-access memory (RAM), 2K of 8-bit programmable random-access memory (Prom) sockets or 4K of 8-bit read-only memory (ROM) sockets. Input/output has 24 bidirectional lines and direct memory access is available.

Prices start at $375 in single unit orders from the firm at 2589 Scott Blvd., Santa Clara, Calif. 95050.

AMT Has System

SANTA CLARA, Calif. – The AMT 2650 from Applied Microtechnology (AMI) is a self-contained microcomputer card system using the Signetics 2650 microprocessor, its vendor said.

The unit allows the circuit and system designer to hand load and debug programs using the micro's instruction set, the firm said.

The AMT 2650 contains 256 bytes of random-access memory (RAM) and costs $195 from the firm at 100 N. Winchester, Santa Clara, Calif. 95050.

Single-Card Device Has 8080-Type CPU

WICHITA, Kan. – The MT80A single-card microcomputer from Mycro-Tek, Inc. has an 8080-type CPU, 2K of erasable programmable read-only memory (Eprom), 256 bytes of random-access memory (RAM), 48 programmable I/O bits and an RS-232 port on a printed circuit card, the vendor said.

A switch-selectable RS-232C clock rate gives most standard rates from 110- to 9,600 bit/sec.

The board has power-on reset and can be expanded by adding more cards, Mycro-Tek said.

The single-unit price is about $250; in 100-unit quantities, the micro costs $150. Prices include the CPU with sockets for 2K of Eprom and 24 I/O lines from the firm at 215 N. Washington, Wichita, Kan. 67201.

Ebka Familiarizor Has Hexadecimal Keys

OKLAHOMA CITY, Okla. – The Familiarizor is a microcomputer system from Ebka Industries with a hexadecimal keyboard and display on a printed circuit board.

The package includes hardware and programming manuals. Power supply must be added.

The system is built around an MQS Technology, Inc. 6502 microprocessor that can address up to 65K bytes of memory.

The system is available for $229 in kit form or $285 assembled; optional power supply costs $58 from Ebka at 6920 Melrose Lane, Oklahoma City, Okla. 73127.

Comp-Sultants 440 Unit Features Hardware Monitor

HUNTSVILLE, Ala. – The 440 micro from Comp-Sultants, Inc. is a 4-bit microcomputer featuring a hardware monitor.

The system includes a CPU board, power supply/teletypewriter board and full documentation. It costs $194.40 in single unit quantities.

The firm will assemble and test the unit before delivery for $20, a spokesman said from P.O. Box 1016, Huntsville, Ala. 35807.

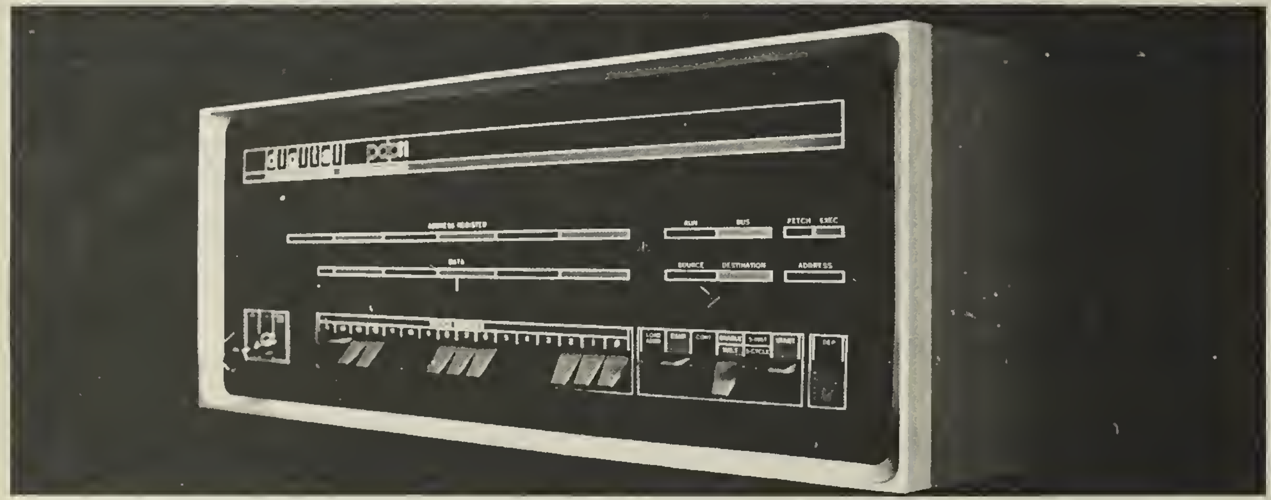
Abacus System Costs $700

LOS ANGELES – Information Control Corp.'s Abacus micro system includes a microprocessor, clock and control, 500 bytes of read-only memory (ROM), 1K random-access memory (RAM), two I/O ports, card cage, wiring and testing, the firm said. The system sells for about $700.

A microcomputer development system dubbed Commander MDS features software editor, monitor and assembler, audio tape cassette I/O, a CRT and optional line printer.

Information is available from the firm at 9610 Bellanca Ave., Los Angeles, Calif. 90045.

Need DEC Memory?



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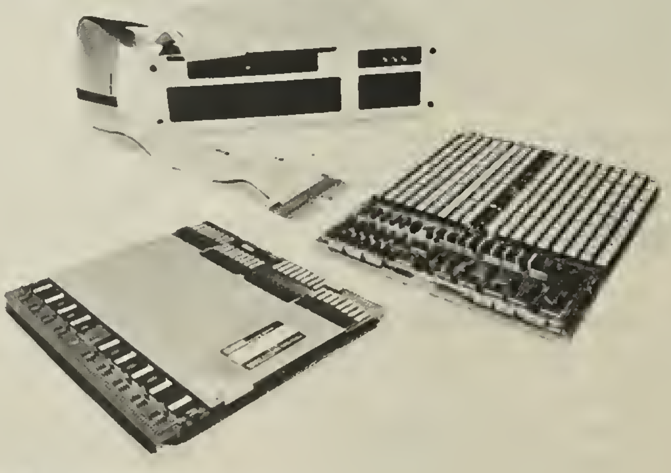

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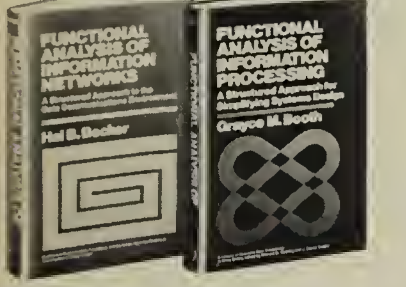
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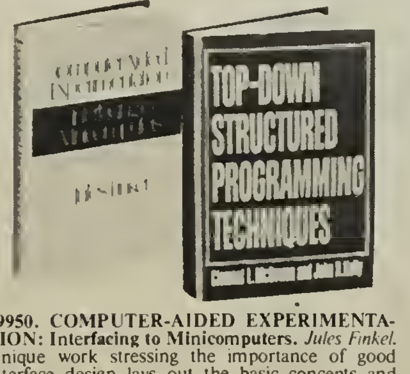

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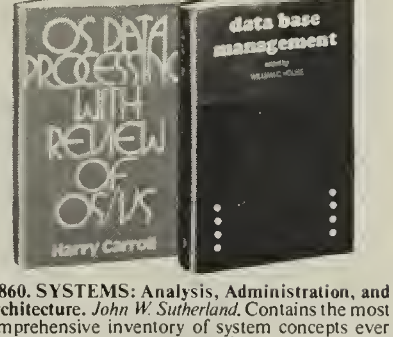

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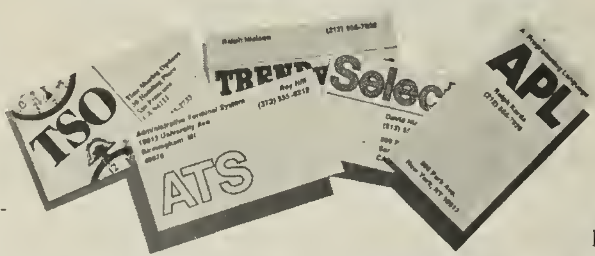

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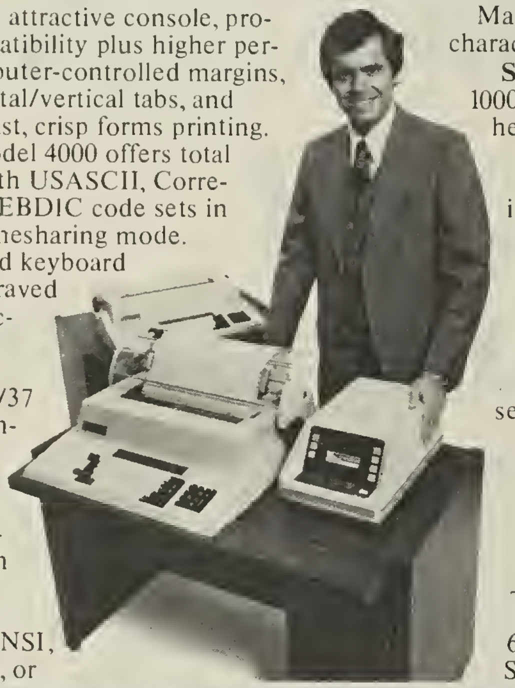

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Mini Helps Specialty Firm Remain Price-Competitive

ALTOONA, Pa. – To keep up with increased price competition, a specialty job order firm here is using a minicomputer.

"Especially during a business downturn, a competitor may trim a few cents off the price to get the business," Edward Oliphant, president of Small Tube Products, said. "This makes a book price obsolete. We need immediate cost information to see whether or not we can meet a price."

The majority of the firm's work is devoted to drawing tube-to-order specifications. The company sees fast turnaround of pricing information as vital.

"At the beginning, we were calculating prices by hand," James Woomer, who is responsible for the cost department and data processing, said.

Gathering the data and calculating the price manually was time-consuming, Woomer said. The average waiting time between the salesman's request and when he received the estimate was two days, he added.

As an interim measure, Woomer began batch processing the cost estimates on the company's NCR Century 101 mini. This cut turnaround time from two days to less than 24 hours, he said.

That wasn't fast enough, so Woomer had the computer upgraded with another disk drive, an NCR 796 CRT display terminal which is used on-line and additional processor memory to permit operation in a dual-programming mode. While in the batch mode, all price estimates were run once a day.

The CRT terminal was located in the cost department, where estimators could key in data and receive the cost breakdown and price.

The processor is programmed to interrupt its batch processing to access the cost information from the files on command of the terminal, Woomer said.

First Installed 395

In 1969 the firm installed an NCR 395 bookkeeping machine to help handle an increasing amount of work in the accounting department. Two years later the bookkeeping machine had reached its limit, and Woomer upgraded to a small NCR 500 computer.

Then the increasing workload became too much for the NCR 500. "We wanted something that would allow us to upgrade without rewriting a lot of our programs," Woomer said, "so we installed an NCR Century 50 system."

Two years later, in 1973, Woomer again reached a crossroads. He could add a second shift in the computer room or upgrade again.

"From what we were paying in rental, it was less expensive in the long run to upgrade to the NCR Century 101 system to get the increased speeds and disk capacity," Woomer said.

"The heart of the whole system is the product master file," Woomer said.

The product master file is a complete description of each job the mill has done, filed by a product number and a customer number. "Now, when a customer reorders, all we need is the product number and customer number to access the file and pull out all descriptive information, specifications and tolerances. From this, we print out the work ticket that is sent to the mill," Woomer added.

The work ticket is a five-part form, which includes customer acknowledgement, salesman's copy, shipping copy and file copy.

Order Held on Disk

Once the work ticket is printed, the order information is held on a disk file. The data is printed out periodically as a summary for plant scheduling and as a weekly incoming order report for the president covering 12 weeks in the future. As the order goes into production, time tickets for men and machines are applied against it until completion when the mill order number recalls it and shipping date, actual pounds shipped, both net and gross are added. This is merged with information from the customer master file, and the invoice is printed out by the mini.

After the invoice is printed, the data again goes to disk file, where it is later used for historical statistical summaries.

The cost-estimating system also draws upon the product master file for data, although estimation begins with the operator keying in all production steps for the job.

The first program accesses the product master file for specifications, variances and prices charged in similar jobs, the packaging file and the raw material file. The standards file then is accessed for man/machine costs, and the second program applies the standards to the functions and calculates it.

The final program calculates the cost. The result is a detailed read-out of every function, with a concise summary, and at the bottom line is the cost plus profit for the final price, Woomer said.

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Notes and observations from IBM
which may prove of interest to
data processing professionals.

An integrated data base approach like AEIMS helps Martin Marietta design and produce the Titan III Space Launch Vehicle.

A New Data Base Concept for Engineers

High personnel costs . . . stringent reliability requirements . . . expanding documentation needs. They all make it increasingly important for engineering firms to assure that up-to-date, accurate information is readily available to every user within the organization.

Traditionally, many engineering and manufacturing companies have treated every department as a separate entity. Each would have its own data base and computer programs. With that approach to information handling, however, data corrections or modifications made in one area might have taken a week or longer to reach other departments. The impact on the company's ability to respond to an urgent bid request, or to solve a production problem, could be critical.

To help improve the speed and accuracy of communication between departments, IBM has developed the Administrative Engineering Information Management System (AEIMS) concept. It is a terminal-oriented approach to storing and updating information in a central data base . . . from initial contract award to final product.

The AEIMS concept is designed to eliminate the need for redundant data files, enable many different users to share information when they need it, and help prevent the discrepancies that often crop up in separate data bases.

The Data Systems division of Martin Marietta's Aerospace Group in Denver has already established a system using a similar concept. Called the Technical Requirements Management System (TRMS), Martin Marietta's data base approach is made up of various subsystems corresponding to the functions of requirements identification, planning and scheduling, configuration verification, document status and parts data. The TRMS system uses IBM's Information Management System (IMS) which runs on Martin Marietta's System/370 Model 168 computer based in Orlando, Florida.

"Our greatest administrative problem used to be lack of crosstalk among departments," says David Lucero, chief of configurations management operations. "Now that data entry and corrections can be made directly at our IBM 3270 display terminals, we can operate with the assurance that all of us have exactly the same up-to-date information."

Another benefit is reduced paper generation. Instead of requesting extensive reports on a scheduled basis and then analyzing them manually, people in each department can now select the specific information they need, when they need it.

From an operational point of view, Don Edmunds, TRMS product manager for data systems, says: "Our data base system was developed in close consultation with users. As a result, it is flexible enough to be effective for everything — from our smallest to our most complex projects. Most importantly, the system costs are being recovered through productivity gains."

Computerized Mail System Tracks Customer Correspondence

Over 3,000 pieces of mail—many of which require immediate responses —arrive every morning at the National Guardian Life Insurance Company in Madison, Wisconsin. By noon, all the mail has been opened, sorted, logged, categorized according to request and distributed to the appropriate department.

"The key to our new control system is a computer program designed to keep track of all our correspondence through every stage of processing," says Spencer Francis, director of systems and data processing. "Using the computer, we can locate a file immediately, simply by typing in the name of the policyholder at a terminal, without making phone calls to five or six different departments."

Before using the computer, all written requests were handled by jotting down a policy number and a brief description of the request on ordinary index cards. But as Francis comments, "Index cards have a way of getting lost. Besides, it took a great deal of time for our clerks to sort through all the cards to check on the status of a request."

Under the new "Call-Up" program, every incoming letter is assigned a unique file number which includes a code indicating the nature of the request such as policy changes, accounting changes or general maintenance. This number, along with the name of the policyholder or the agent who wrote the letter, is entered into the company's IBM System/370 Model 135 via several 3277 Display Stations in the records department. The department to which the file is sent is also noted, so that any file can be located within seconds.

In the case of a request for a change of beneficiary, for example, the letter is routed to the policy change department which responds by sending out the correct forms. That information, along with a follow-up date to check on whether the completed forms have been received, is entered at a 3277 terminal handling policy changes. A daily list of files which have reached their follow-up dates is printed and sent to the relevant departments.

"With this system, we can find out the status of a request within seconds, simply by keying in a name at the terminal," says Francis. "It has also been a tremendously effective tool to help us spot potential bottlenecks and keep an accurate record of the number of requests handled by each department."

In addition to current status of change requests, information about more than 120,000 policy files can be accessed at the terminals. The company's data base also includes files retained for five years after they become inactive, as well as new policy applications and information regarding National Guardian's investment portfolio.

The Call-Up program took only a few months to write and test according to senior systems programmer Jim Hartman. "The 3277 terminals are particularly well suited to our operation —very fast and flexible. And our people were able to learn how to operate them within a few minutes," he adds.

"Agents have been impressed with our faster response time," says Francis. "We feel the system gives us a valuable competitive edge in providing a high level of service for our customers."

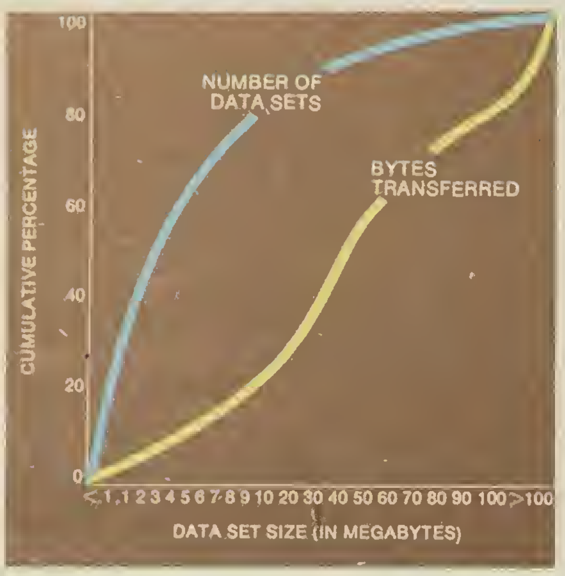
Using a new computerized mail tracking system, clerks enter information regarding incoming requests directly into IBM 3277 Display Stations at National Guardian Life Insurance Company.

Advertisement

Putting Storage Systems Under the Microscope

Because of the importance of storage to the entire data processing function, new developments in storage devices are causing users to take a fresh look at their overall storage systems. As part of such studies, IBM has been assisting with in-depth analyses of the performance of storage installations. The ultimate aim is to determine the optimum storage configuration for each installation.

These comprehensive storage system evaluations go far beyond the speed and cost of specific devices. They include factors such as supplies, labor, and the cost of error recovery. They are based on comprehensive records of actual usage, generated in most cases by IBM Systems Management Facilities (SMF), an adjunct of the computer operating system that logs performance.



For a typical installation, this graph shows cumulative percentages in terms of number of data sets and bytes transferred. Note that the many small data sets contribute only a small part of the total data transferred.

The evaluations answer questions such as: Which data sets are employed most frequently? What is the average data set size for tape and disk? Can high density recording increase system performance?

Results of such studies may be expressed in detailed reports accompanied by usage graphs. Taking into account the nature and objectives of the installation, the studies can lead to recommendations for achieving maximum storage efficiency through the best possible combination of devices.

The systems analysis and recommendation approach worked out quite successfully for the large installation at Trans World Airlines in Kansas City, Missouri. According to Richard D. Pearson, TWA staff vice-president—commercial data processing, "We have already begun to achieve the efficiencies and cost savings anticipated in the original study."

Dramatic Advances In Storage Devices

Behind these analyses is a story of continuing progress in IBM storage. Particularly noteworthy are the 3850 Mass Storage System (MSS) and the 3344 and 3350 Direct Access Storage, which have made possible greatly improved price/performance levels for direct access storage.

The 3850 MSS can be thought of as providing "virtual" capability for direct access storage devices, much as virtual storage (VS) does for mainframe storage. Up to 472 billion bytes can be placed in a "virtual online mode" under direct system control with the MSS. That is the equivalent of 4,720 disk packs (3336 Model 1)—all accessible without manual intervention and at sharply reduced costs per megabyte transferred.

An important characteristic of both the 3344 and the 3350 is fixed-media technology—non-removable sealed head/disk assemblies. Since there are no disk packs or data modules to mount, efficiency and security are improved. And fewer mechanical parts and less restrictive tolerances are an aid to reliability.

Where Fixed-Media Storage Fits In

IBM studies have shown that a growing number of users, particularly those with large installations, rarely if ever change many of their disk packs. For all practical purposes, once they mount a disk pack containing application data, it remains online for as long as they plan to use it.

It's in installations like these that the fixed-media 3344 and 3350 can take over important areas of disk storage and provide improved direct access storage performance at new low costs per megabyte. However, portable storage media—the 3330 and the 3340—will continue to be needed to meet special requirements.

In the IBM storage spectrum, each type of product has a function at which it excels. Together, in the right configuration, they can handle the complete range of storage requirements for any given installation. It is to make sure that each configuration represents the utmost in overall efficiency that IBM helps with comprehensive storage system evaluations. Information on them can be obtained through the IBM Data Processing Division branch office.

24-Hour Banking Is a Hit in Baton Rouge

Pay day is Friday. But now pay day is different.

You get your pay check before lunch hour, as usual—but you no longer need rush to the bank before it closes.

Instead, you can deposit your check at any time you choose over the weekend and withdraw cash at the same time. How? With an online, full service teller machine called the IBM 3614 Consumer Transaction Facility.

In Baton Rouge, Louisiana, this kind of convenience is a reality for customers of the Fidelity National Bank. Fidelity's six 3614s stand ready to accept deposits to checking and savings accounts and dispense cash from them 24 hours a day, seven days a week.

"In fact, our 3614s can handle almost any teller transaction," says Frank S. Craig Jr., president of the Fidelity National Bank of Baton Rouge. "That includes transferring funds from one account to another, accepting installment loan payments and informing customers of their current account balances. You can even order a new supply of checks through them."

A 3614 automated teller machine in use around the clock at Fidelity National Bank at Baton Rouge, La.

Five of Fidelity's machines are "through the wall" models located at branch banking offices, while the sixth is in the lobby of the main office. All it takes to operate them is a magnetically encoded plastic card, which the bank makes available to its customers, together with a personal identification number. The customer inserts the card in a slot in the 3614 and keys in his personal ID number. Simple instructions for each step of a transaction appear on a display panel in the machine.

"The public reception of the 3614s has been tremendous," says Mr. Craig. "We haven't been able to keep up with the demand from our customers for their cards. It seems that 'anytime banking', as we call it, meets a real need, especially on weekends. We're particularly pleased that deposits through the 3614s have exceeded withdrawals."

In recent months, the full-function 3614 has been installed at a number of banks and financial institutions across the country. It is part of the IBM 3600 Finance Communication System, a family of terminals designed to speed and simplify banking operations.

At Fidelity, installation of the 3614s was preceded by the development of an integrated Customer Information File (CIF), through which information on every customer and type of account can be accessed both by the 3614s and by IBM display terminals. Fidelity is proceeding with plans for a complete online teller network as the next phase in implementing the 3600 system.

Alive and well in Redondo Beach, this starfish lives in a mixture of ordinary and recycled sea water.

Environmental Research Aided by TSO

For snails, starfish and sea urchins who live in the King Harbor area of the California coast, life has never been better. At least that's what studies of the sea creatures seem to indicate to scientists at Southern California Edison.

According to Kevin A. Muench, chief marine research scientist and director of the utility's Redondo Beach laboratory, preliminary results of a novel research program show that growth of marine life is expanding, due to the warmer temperatures of water that has been used to cool power plant condensers and has then been returned to the harbor.

Key to the study is the interactive IBM Time Sharing Option (TSO), together with PL/1, a powerful IBM language. Using them, scientists can speed data to the central computer for analysis and return. Throughout Southern California Edison, some 250 people—including scientists and engineers involved with construction and power supply, and financial and customer service personnel—can sit down at remote terminals and communicate directly with the computer whenever they need to.

Robert Umbaugh, Edison's data processing manager, reports, "By putting TSO on System/370 Model 168, we've eliminated outside timesharing charges of $400,000 a year. TSO, PL/1 and VS BASIC, have made the computer as much a part of the engineer's tools as a desk or pencil. With them we're getting a lot more for less."

While long active in marine monitoring, Southern California Edison began its specific research program at Redondo Beach over a year ago to assess any potential disruption of biological patterns caused by water which returns to the harbor several degrees warmer.

The long-range goal of the program is predictive biological modeling, which will help the utility plan and operate future power plants in ways that will maintain a balanced marine life.

DP Dialogue appears regularly in these pages. As its name suggests, we hope DP Dialogue will be a two-way medium for DP professionals. We'd like to hear from you. Just write: Editor, DP Dialogue, IBM Data Processing Division, White Plains, N.Y. 10604.

76-2

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CI Notes

CDC, ICL Form Joint Firm

MINNEAPOLIS – Control Data Corp. and International Computer Ltd. (ICL) have agreed in principle to form a jointly owned company, Control Dataset Ltd., to manufacture and market computer media and supplies to computer users throughout the UK.

Terms of the agreement call for CDC's business products operation in the UK and those of Dataset, a wholly owned subsidiary of ICL, to be transferred to the new company.

CDC will own 75% and ICL 25% of Control Dataset Ltd. Initial assets are valued at about $5 million, but do not include CDC's manufacturing facility at Brynmawr, South Wales, CDC said.

Dataproducts Eyes New Printers

NEW YORK – Dataproducts Corp. is developing lower cost printers, President Graham Tyson recently told security analysts here.

Its lowest cost products will employ matrix technology, he added, and are being developed in its Sunnyvale, Calif., facility.

Another family of printers will employ what he terms "evolutionary improvements" in its actuator and horizontal-font technology, along with integrated circuit logic and actuator drives.

CDC, American Express Settle Suit

NEW YORK – The law suits involving American Express Co. and Control Data Corp. and its subsidiary, Ticketron, Inc., have been settled for undisclosed terms.

American Express had sued CDC and Ticketron for $30 million, charging them with ticketing services deficiencies during the American Film Theatre's 1973-74 season.

CDC and Ticketron countered with a $31 million suit, claiming American Express was responsible for the alleged ticketing problems and was in breach of contract with Ticketron for nonpayment [CW, Aug. 13].

Supershorts

Data General Corp. has delivered its first Nova 3 with in-house manufactured MOS memory.

– – –

Cambridge Memories, Inc. has retained Raytheon Service Co. for field service of its end-user products.

– – –

Grumman Data Systems Corp. has appointed the Institut fur Angewandte Elektronik as distributor of its printer controller in Germany and Digital Interfaces Ltd. as its Canadian distributor.

But Firm Sees Gains in '76

Leasing Could Flatten Burroughs Quarter

By Molly Upton
Of the CW Staff

DETROIT – In spite of what looks like a slow start in the first quarter, Burroughs Corp. expects to show good earnings and revenue gains for 1976 as a whole and looks forward to stronger gains in 1977, Chairman Ray W. Macdonald told stockholders at the firm's annual meeting here recently.

But if the firm continues the trend evident in the first two months – an abnormally high level of deliveries of leased equipment – it will be difficult to surpass the revenue and earnings gains of the 1975 first quarter, he said.

In addition to reviewing Burroughs' prospects for 1976 and accomplishments in 1975, Macdonald gave a preview of new products. These included very small microcomputer-based systems with the Master Control Program, which will be announced "very soon," as well as additions to the intermediate range in the second half of this year.

The firm will also introduce an "Inquiry" feature allowing managers unfamiliar with programming procedures to retrieve information from systems, he said.

In hinting about improvements to the large systems, Macdonald said "users of other systems will find Burroughs an increasingly attractive alternative to their present computer systems suppliers."

Orders Rise 29%

Explaining the order pattern of the first two months, he said orders were up 29% compared with the year-ago period and the sales value of equipment delivered rose 30% compared with the same 1975 period.

But because of the shift in the normal mix of outright sales and lease equipment, actual revenues for the two-month period rose 11%, he said.

"The strength of orders so far this year indicates to us that with continued good revenue gains, earnings improvement may well start in the second quarter with continued improvement throughout the second half," he said.

Shipments at sales value in 1976, including shipments by Burroughs' newly acquired Japanese company, are expected to increase 20% to 25% or 15% to 17% if 1975 figures are restated to include the Japanese deliveries at retail value, he explained.

The sales value of DP systems and products shipped during 1975 reached a record high of $1.43 billion, up 12% over 1974's record, he said.

"We believe this may be the strongest rate of gain experienced by any major mainframe manufacturer last year," Macdonald said.

During 1975, incoming orders rose 8% above those in 1974, while in the fourth quarter total orders jumped 25% above the year-ago period.

Orders for commercial products and equipment rose 38% in the fourth quarter.

'Well-Poised' for Changes

"Burroughs is exceptionally well-poised to capitalize on changes in the DP market with new products in all system categories," Macdonald remarked.

Burroughs expects strong and continued growth in central systems at the same time a significant trend is developing toward increasing levels of decentralization, he said.

Macdonald also noted the trend to computing by small businesses. Market interest in Burroughs' small systems appears to have been stimulated by other manufacturers' product announcements, he said.

Orders for the B1700 series and the B700 reached record levels during 1975, he said, with B1700 orders 40% ahead of those in 1974. Worldwide orders for B700 systems more than doubled, while B700 orders in the U.S. reached 314% of the 1974 level.

Over 125,000 units of the Series L type of business minicomputers are installed or on order. Delivery rates for those systems have reached 20,000 to 25,000 units in each of the past two years, he said, adding the firm plans to expand its marketing force for small systems.

Stimulated by the introduction of the B6738 entry-level system, demand for the B6700 and B7700 systems rose 47% in 1975 compared with 1974. Shipments of B7700s reached record levels, he said.

Burroughs has continued to expand its Business Management Systems library of application programs on its Series L, B700 and B1700 systems. "This library now covers most major lines of business and many specialty areas," Macdonald said.

Revenue from software sales rose 12% in 1975 over 1974 and 240% compared with 1971.

Marketing manpower has risen 32% since 1970, he said, while revenue has almost doubled.

The field engineering force of 12,000 people generated revenues of $335.6 million, he said.

(Continued on Page 47)

IBM Could Starve Competition By Cutting Its Prices: Currie

By Nancy French
Of the CW Staff

NEW YORK – If IBM ever decided to lower its prices, it could starve out its competitors, Rigdon Currie, Xerox Corp.'s director of special businesses, recently told the U.S. vs. IBM antitrust trial here.

Appearing as a government witness, Currie described Burroughs Corp. as the "healthiest" of IBM's mainframe competitors.

Burroughs, according to Currie's estimates, holds a 7% to 8% share of the mainframe market; he judged IBM's share to be "in excess of 66%."

The testimony came during redirect examination by Justice Department attorney George Dole, who asked Currie a series of pricing questions triggered by Currie's earlier testimony about the difficulties Xerox Data Systems experienced when Digital Equipment Corp. cut prices on its Decsystem-10 in 1972 [CW, April 5].

Any manufacturer can decide to lower prices, Currie told the court. But IBM has "an adequate profit picture" and, if it chose to lower prices, it could "break even for some period of time," he said.

If IBM lowered its prices, its competitors would also have to lower their prices in the markets where they were competing with IBM, he said.

"If IBM lowered its prices, would its financial position be a factor?" Dole asked.

"IBM could tolerate a situation such as that for a period of time – IBM could survive as a company . . . longer than the other companies," Currie replied.

Currie followed witnesses from Honeywell Information Systems, RCA and Univac who also testified that IBM could control its survival in the marketplace from a pricing standpoint.

Currie was also not the first witness here to testify his company's goal was to be "number two" in the computer business.

The Univac and RCA witnesses said their firms had the same goal because it was simply not realistic to aspire to anything more.

Currie estimated Xerox could have been number two with a market share of 12%. However, it would have taken "about a billion dollars" in annual revenues.

(Continued on Page 47)

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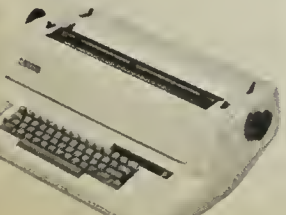

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Date of Comshare Offering No Accident

By Molly Upton

Of the CW Staff

DETROIT – Comshare, Inc.'s announcement of its replacement cost accounting capability the same day the Securities and Exchange Commission (SEC) declared large U.S. firms must report in this manner this year (see related story on Page 62) was no accident, according to Michael D. Radice, manager of certified public accounting systems at Comshare.

Rather, it reflected the firm's decision to specialize in three principal areas, one of which is accounting, and its strategy to "leapfrog mundane accounting activities" to allow work on state-of-the-art technology and forthcoming trends in regulations," he said.

Calling the SEC decision "the biggest leap in accounting for the next 100 years," Radice said he hopes firms will recognize this as an intermediate step and go to current value accounting.

Comshare already has clients for its Replacement Cost Current Value Accounting system, which was developed by Valuation Systems Corp., a consulting firm to certified public accountants.

Through a joint business relationship, Comshare is offering this capability, he said.

Under the SEC edict, firms with assets of more than $100 million must report to the SEC the replacement cost of their fixed assets, such as plants and machinery.

Currently many firms carry these assets at greatly reduced value because of depreciation.

Current value accounting means firms report the current value of their liquid as well as tangible assets, Radice explained.

Good T/S Application

Not only does the SEC policy change become effective for firms ending their fiscal year as of Dec. 25, 1976, which leaves little time to set up a system, but the change also implies the use of a large data base to calculate the value of these fixed assets, he said.

CW Photo by M. Upton

Michael A. Radice

Companies are faced with a tremendous data-gathering task, he said, which is one of the reasons why the application lends itself to time-sharing. Various company branches can feed their data into a time-sharing firm.

Radice categorized the replacement value system more as an information system than as an accounting system.

Rather than making up their own values for a building, firms reporting in this manner to the SEC must use public data to determine values, he said.

Also, firms are concerned how their books look compared with those of other firms in that industry segment, so it helps to use the same base of data when computing values.

The Comshare valuation system is essentially a data base with 47,000 classifications representing all manufactured goods. In addition, there are such other factors as the wholesale price and consumer price indexes, which are kept current.

Radice predicted the Financial Accounting Standards Board (FASB) will go the SEC one better and call for current value reporting this fall.

Compass the First

Comshare started emphasizing its offerings to the accounting area last May when it brought out Compass, its professional accounting system and service, for which it now has 125 clients, according to a spokeswoman.

Twenty-three out of 25 of the country's largest CPA firms use Comshare services, Radice said.

Through its specialization, the firm can pay attention to detail in particular fields and build in value-added features. By focusing attention on what the SEC and FASB are doing, Radice said, "what went by the boards in the past becomes a significant opportunity."

Much of the accounting offerings are written in the jargon of the CPA to help the computer make sense to them, he said.

In addition, specializing allows the firm to synergize, or use what it had done before, and make it meaningful and topical to specific areas, rather than reinventing anything, he said.

Other areas Comshare specializes in are personnel and information systems for telephone companies.

In addition, the firm also offers a general base of services. It has a group whose assignment is to explore new areas for offerings and an engineering group to make the hardware it finds it needs, such as the Telegrid error-detection terminal.

The firm, which uses Xerox Sigma 9s and 940s, has offices in Canada, the UK, Belgium and Holland, as well as a joint venture in Japan.

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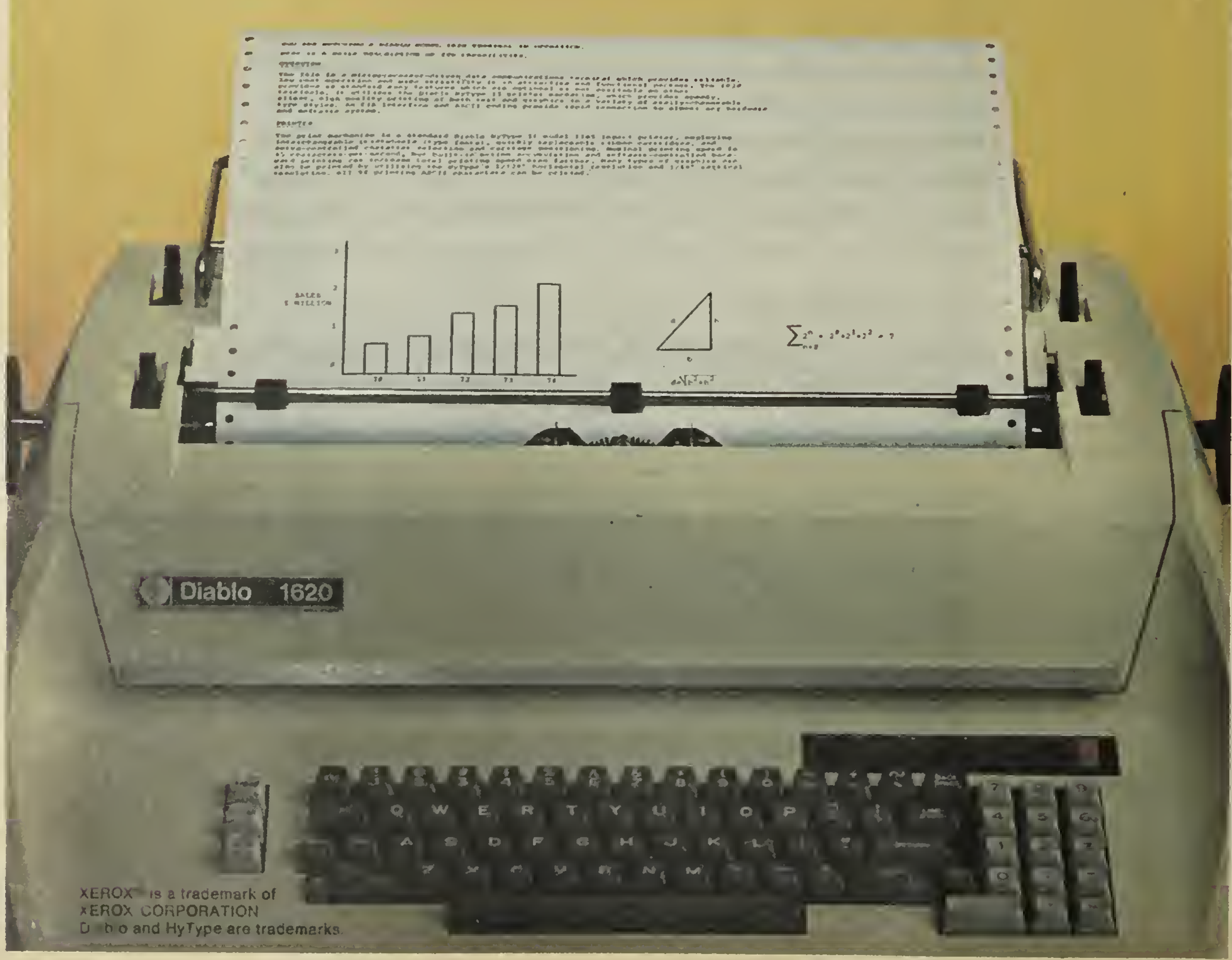

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Industry-Specific Software Increased by Burroughs

By Molly Upton
Of the CW Staff

DETROIT – "With great vigor," Burroughs Corp. is placing increasing emphasis on developing applications software oriented to specific industries, according to Fred R. Meier, vice-president of product management.

The firm has been putting out program products for the Series L since 1969 and also has them for the B700, B1700 and large and medium systems, he said.

Many elements of systems software could be called applications software, but Burroughs calls these "environmental," he said.

Burroughs' software development costs are almost as great as those for hardware, he said.

The firm is charging more for the software, he said, in line with the emphasis on supplying it rather than leaving the customer with "do-it-yourself primitive software" or turning him to contract houses, he said.

Marketing is oriented to large and general accounts and then by various lines of business, he said. Part of the firm's growth plan includes increased specialization by line of business, he observed.

In remarking on the upswing in deliveries in small systems during the first two months of the year (see related story on Page 45), Meier said the introduction of the IBM 32 has been a real plus.

However, the high number of small systems was a factor in skewing the firm's lease/purchase ratio for this period as many were leased, he said. Normally the 32 tends to be leased initially, he explained, whereas Burroughs had previously tended to sell its small machines, he said.

CW Photo by M. Upton

Fred R. Meier

Counting the Series L machines, Burroughs has more small computers installed than any other firm, he said.

Burroughs "has a very open-arms attitude toward the OEM industry. We want to see it be healthy," he said. The firm both buys from and supplies OEMs with peripherals.

Meier predicted there may be more OEMing among firms with production plants located abroad in order to either satisfy domestic requirements about native products or avoid tariffs.

Burroughs Sees Rise of Leasing Cutting Into First-Quarter Net

(Continued from Page 45)

Focusing on Burroughs' acquisition of Redactron Corp. and Graphic Sciences, Inc., Macdonald said the firm plans several new products in the area of office systems.

Production Staying Level

President Paul S. Mirabito said the firm's 1976 production level is expected to be about equal to the 1975 level, which was 12% above that of 1974. In each of the previous two years, production increased 34%, he said.

In addition to planning further plant expansion, Mirabito noted that "as technology leads to products of progressively smaller dimensions, our present plants can accommodate higher production volumes."

This more efficient use of existing space "will allow us to shift the major emphasis of our capital budget to investments in technology, tooling and test equipment rather than buildings," he added.

The Burroughs Current Mode Logic high-speed high-density circuits, which are used in the 800 series, will also aid in reducing the sizes of memory and peripheral units, Mirabito said.

The R&D budget for 1976 is expected to reach $110 million compared with over $100 million in 1975.

In addition to microprocessors, research teams are also working on amorphous and crystalline semiconductors and magnetic bubble devices, he said.

Capital expenditures for 1976 are expected to grow to about $300 million compared with $286 million in 1975, he said.

The firm expects to apply about $210 million for additions to its rental base and $90 million for plants, tools and equipment related to new products and further expansion of marketing facilities.

Depreciation is expected to total $180 million in 1976, up 14% from 1975, he said.

Pretax margins improved to 17% compared with 15% in 1974.

After issuing $100 million in five-year notes earlier this year, the firm sees no additional financing requirements in the intermediate term, Mirabito said.

The financing was to offset short-term debt incurred from the acquisition of Redactron and its new marketing company in Japan and to improve balance sheet ratios, he said.

Overall, the firm plans to cut total borrowings by $50 million to $100 million in 1976 as a result of increased profits and improved asset utilization, he said.

IBM Price Cuts a Threat: Currie

(Continued from Page 45)

In fact, Currie observed, a 3% market share was actually a more realistic goal, he said.

A large market share gives IBM many advantages, he explained. The first financial strength with its accompanying good cash position, good credit rating and large lease base.

Second, Currie said, it gives IBM a good geographical disperson of sales and service forces.

Third, it permits good representation in a number of market segments that may have different business cycles and, finally, it supplies the ability to support a substantial R&D effort, he said.

Further, he noted, the company has a certain momentum from the installed base.

Mainframer Definition

Under cross-examination by IBM attorney Thomas D. Barr, Currie said he thought any company that manufactured its own CPU could be considered a mainframe manufacturer.

When asked to name all of Xerox's competitors in the various application areas for which that firm marketed products, Currie named almost everyone in the business.

'Effective Competitors'

However, under redirect examination by government attorney Dole, who asked him to name only the "effective" competitors, Currie shortened his list in almost every application area.

"Effective," in Currie's mind, is an adjective that can be applied to only those companies that sell 30% of the business they go after.

For example, in the area of real-time systems, Currie named some 13 competitors on his original list. When asked to name the "effective" competitors, Currie named only Digital Equipment Corp., Systems Engineering Laboratories (SEL), IBM, Univac, Modular Computer Corp. and "some minicomputer firms."

In scientific batch, Currie again reduced his list, citing as effective competitors only IBM, DEC, SEL, Control Data Corp. and Univac, adding that CDC has dropped out of this area of competition to emphasize its larger systems.

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Wang Taking Own Route to Market Latest Peripherals

By Molly Upton
Of the CW Staff

TEWKSBURY, Mass. – Wang Laboratories, Inc. has added two more peripherals to its line of in-house products [CW, April 5] and plans to market the Model 2231W 120 char./sec printer through about 25 representatives selling to the small OEM buyer and the large end user, according to Ned Chang, senior vice-president of marketing.

The firm is currently discussing selling the Model 2272 plotter in the same manner, he said.

"We intend to become a major factor in the small computer business, and we know that in order to do so we must manufacture a wide range of peripheral devices," Chang said.

"In-house design and manufacturing enable us to provide better features for our end users and give us better control over the reliability of our products from the standpoint of servicing by our customer service organization.

"Finally, we can also realize better profit margins on our systems."

Wang is seeking not the OEM buyer that orders thousands of units, but rather smaller firms that need dozens, he said.

Chang views Wang's route as a more direct way to get to the end user. Firms that would buy printers in quantities of thousands will probably end up making their own, he said, noting the selling cycle takes one or two years.

By going through reps, he said, Wang can approach the small OEMs and systems houses and also large user organizations.

Printer Fills Gap

Wang is offering its 2231W 7 by 9 dot matrix printer, which operates at 120 char./sec, for $2,900 in single quantities. The firm offers an RS-232 interface as an option, he said.

The 2231W fills the gap between 30 char./sec printers and 165 char./sec units available on the market, he said.

The market for the printer is "people who are now using 165 char./sec printers and paying more for performance than they need and people who are now beating 30 char./sec printers to death," Chang said.

The 2231W supplements Wang's 200 char./sec model that sells for $5,000. Demand for the latter has exceeded expectations, according to John Cunningham, senior vice-president.

Chang said the firm has been selling the 200 char./sec printer through its representative channels for about six months.

Wang has been shipping other makers' printers with its systems since 1967 and has shipped over 26,000 alphanumeric printers, he said.

Wang has learned what users want, he said, and the 2231W embodies several techniques for reliability and longevity, including a Moebius strip that allows the ribbon to wear evenly at the top and bottom.

This should ensure that ribbons last twice as long on the Wang unit as on competing printers, he said.

The 7 by 9 dot matrix is expandable under program control, he added.

The firm claims longer life for the bearing head since it incorporates a double-axis design.

Chang thinks the firm's drum plotter, the Model 2272 series, will compete with storage CRT-based plotting systems that often use thermal printers for hard copy.

With the plotter, which sells for $2,900, and a Wang portable computing system, the user can have a system for $8,300. Using this system, it "makes sense to plot from the CRT more often, rather than to pay more for a storage CRT or waste a lot of memory on refresh display and still have to worry about hard-copy output," he said.

The plotter incorporates an Intel 8080 microprocessor which digitally linearizes the motion by controlling small DC stepping motors, Chang explained.

Support Group Among 10 Largest

TEWKSBURY, Mass. – Wang Laboratories, Inc.'s customer support organization is "already one of the 10 largest in the computer industry," according to Ned Chang, senior vice-president of marketing.

Wang's end-user support organization "is of a dimension that clearly differentiates it from virtually all minicomputer, terminal and small batch-processing companies," he stated.

Over 1,300 persons are in the worldwide field sales group, half of them in direct sales functions. An additional 600 field-engineering employees provide maintenance coverage, he said.

Wang also maintains a 200-firm software vendor network which supplements programming support.

"This structure enables us to accept increasing responsibility for the ultimate performance of our equipment at a user's site. It is a fundamental difference between Wang and most of its principal competitors," Chang added.

Wang's installations are split about 50-50 between technical and commercial environments.

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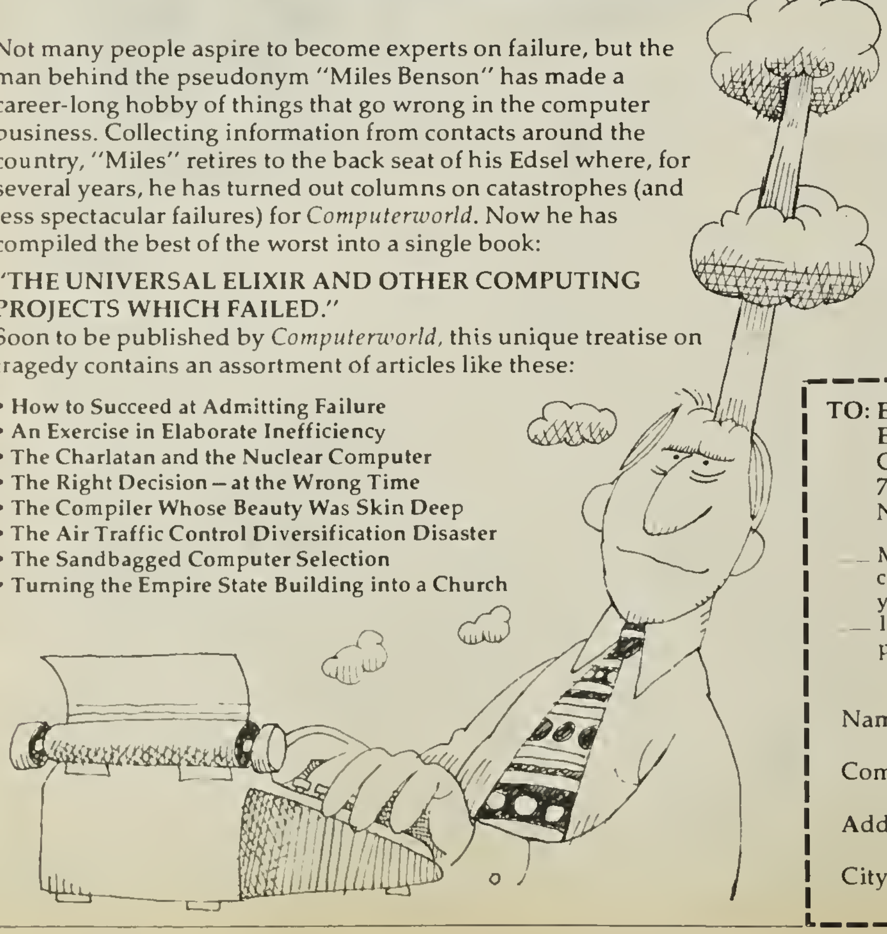
Who is Miles Benson, and why is he writing about things that went wrong?



Not many people aspire to become experts on failure, but the man behind the pseudonym "Miles Benson" has made a career-long hobby of things that go wrong in the computer business. Collecting information from contacts around the country, "Miles" retires to the back seat of his Edsel where, for several years, he has turned out columns on catastrophes (and less spectacular failures) for *Computerworld*. Now he has compiled the best of the worst into a single book:

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2ND DAY: SOFTWARE 76: Audit Software & Data Security. Data Base Management Packages. Software as a Measurement Tool. Packaged Applications.

3RD DAY: COMPUTER NETWORKS: Distributed Computing. Network Planning/On-Line Terminals and their Applications. Front-End Processors/Selection and Use.

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FORUM REGISTRATION FORM

Advance registration is not required for attendance at the exhibits only

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(617) 965-5800

Register me for ☐All three days ☐1st day ☐2nd day ☐3rd day.
(Copy this form to register additional people. When you register for three or more days -- for yourself or any number of individuals in any combination -- you get a $5 per day multiple registration discount.)

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☐ **DALLAS** Apr. 20-22 Market Hall
☐ **LOS ANGELES*** May 4-6 L.A. Convention Center
☐ **SAN FRANCISCO*** May 11-13 San Francisco Civic Auditorium

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Please circle one number in each category below.
(We must have this information to complete your registration.)

BUSINESS/INDUSTRY
10 Manufacturer of Computer or DP Hardware/Peripherals
20 Manufacturer (other)
30 DP Service Bureau/Software/Planning/Consulting
40 Public Utility/Communication Systems/Transportation
50 Wholesale/Retail Trade
60 Finance/Insurance/Real Estate
70 Mining/Construction/Petroleum/Refining
75 Business Service (except DP)
80 Education/Medicine/Law
85 Government – Federal/State/Local
90 Printing/Publishing/Other Communication Service
95 Other

TITLE/OCCUPATION/FUNCTION
11 President/Owner/Partner/General Manager
12 VP/Assistant VP
13 Treasurer/Controller/Finance Officer
21 Director/Manager of Operation/Planning/Administrative Service
22 Director/Manager/Supervisor DP
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
41 Application Engineer
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52 Other Sales/Marketing
60 Consultant
70 Lawyer/Accountant
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Supreme!...

Detroit turned its attention from automobiles to automation as Computer Caravan 76 came to town for the first time since 1972, when "Computer Caravan" was a brand new idea just becoming a reality in its first nationwide tour. According to projections from International Data Corporation, Detroit is the country's eighth largest computer market, with more than 1,000 computer sites, and almost 1400 general purpose computer systems installed, with a total value of $713 million. And the DP people who run those sites gave us a very warm welcome. . . . .Some of them are shown above as they looked over the products and services of a wide variety of leading computer companies. . . . .At the NCI booth, Bruce Forsberg, Vice President, accepts an entry in the NCI drawing. NCI's software products are designed to improve the effectiveness of IBM 360/370 installations (B and H). . .BASF's Jack O'Leary (D) stands in front of photos of some of BASF's magnetic media products, which include Data Modules, Disk Packs, Disk Cartridges, Flexydisks, Digital Cassettes and Computer Tape (A). . . . . At the Lockheed booth, Ginger Robinson and Linda Urban demonstrate the Lockheed System III Multi-user business computer system, featuring dual programming capabilities via auxiliary CRT/Keyboard terminals (M). . . . . The Software Gallery awaits show opening to display its unattended presentations of software packages from three leading companies (O), while the shot of Beehive's Sales Manager, Frank Richins (L), also shows a partial list of software products from Software International's booth. Software International is displaying its MMS General Ledger, Accounts Payable, Accounts Receivable, Net Change Material, Requirements Planning, and Payroll/Personnel Packages, plus a complete line of banking packages. Beehive's products include a series of high performance video display terminals and the microprogrammable Super Bee 2. . . .Other products and services on display included: Datapoint's complete line of processor-based terminal equipment and the Datashare business timesharing system (C); Anderson Jacobson's data modems, acoustic couplers, and printer terminals (E and J); Cooke Engineering's custom tech control systems (F); Houston Instrument's 2400 line-per-minute, $3,000 printer (G); Delta Data's user programmable and microprogrammable display terminals, as well as its Model 5270 display terminal/light pen system (K); Key Tronic's DATAWAND hand-held OCR system (N); Telefile's DC-16-C Disk System for minicomputer users (P); and Interdata's Computer Life Support Exhibit, including IPAC packaged system, OEM minicomputers and the Carousel printer terminal (Q).

...Thanks, Motown, for your great review of Computer Caravan 76. Next stop on our drive: Chicago - April 13th.

See you there!

Exhibit Hours - 10A.M. - 5P.M.

CHICAGO Apr. 13-15 McCormick Place
DALLAS Apr. 20-22 Market Hall
LOS ANGELES May 4-6 L.A. Convention Center
SAN FRANCISCO May 11-13 San Francisco Civic Auditorium

COMPUTER
CARAVAN
76

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Nine Nations Launch Euronet

PARIS - A meeting of nine national postal administrations was held here recently to launch plans for a European data transmission network known as Euronet.

The network was designed to meet the requirements of about 700 research organizations from both the public and private sectors in accessing scientific and technical information.

Plans call for Euronet to be operational in June 1977, according to a report in *The Financial Times*. The net will have switching centers in Rome, Frankfurt, Paris and London, as well as concentrators in Brussels, Amsterdam, Copenhagen and Dublin. The main computer center will be in Luxembourg.

The net will be set up and run by a consortium of the nine postal administrations in the European Commission.

International News

Japan's Miti Starting Ultra-LSI Project

TOKYO – The Japanese Ministry of International Trade and Industry's (Miti) development of ultra-LSI technology is scheduled to begin this month amidst grumblings by firms not inluded in either the Miti or a Nippon Telegraph and Telephone (NTT) project, according to *EDP Japan Report* (EDP/JR).

The firms excluded from the development work are upset and claim that government subsidy of large firms to participate in development projects is preferential, EDP/JR reported.

The Miti project, which will concentrate on LSI logic, has already undergone budget cuts by the government, with funds reduced one-third to $200 million, the newsletter said.

The firms involved in this project include the Fujitsu-Hitachi-Mitsubishi group, the Nippon Electric Co. (NEC) and Toshiba, according to EDP/JR.

The government will provide half of the total budget with the other half coming from the manufacturers involved.

In another project, NTT is underwriting the $100 million budget for work on LSI memory and ultra-LSI circuits to be used for communications equipment.

The firms engaged in this include Fujitsu, Hitachi and NEC.

Although the projects are scheduled to proceed independently, Miti and NTT have been discussing how to coordinate R&D activities and are expected to reach some conclusions soon, EDP/JR said.

The two have set up a joint laboratory in NEC's central research laboratory.

NTT has set up departments for work on integrated circuits and memories at its Musashino Electrical Communication Laboratory.

An NTT official indicated about 70% of its ultra-LSI development work will apply to new communications devices and 30% to fundamental microelectronic technologies, according to EDP/JR.

Danish Group Finds Specialized Corner Of Software Market

By Ivan Berenyi

Special to Computerworld

COPENHAGEN, Denmark – A group of 11 Danish engineers have quietly cornered a highly specialized but increasingly important area of the world software market – modeling systems for inland, coastal and offshore engineering projects.

The engineers, all hydraulics specialists, belong to the five-year-old Computational Hydraulics Institute (CHI), a nonprofit body linked to the Danish Academy of Technical Science.

Using the IBM 370/165 mainframe installed at the Northern European University Computing Centre (Neucc) on the campus of the Technical University of Denmark, CHI has developed four major systems of international repute.

Simulates Water Flow

The first, officially called System 11 but also known as "Siva," simulates rivers, canals, lakes, sewage networks and simple estuaries where the feeder streams are well mixed.

System 21, "Jupiter," was developed from Siva for more complex estuaries, coastal waters and shallow seas, while System 12/13, "Neptune," is used for modeling water flows stratified by density, such as those which occur in tidal estuaries and around hot-water discharges from power stations.

The fourth system, System 22, is still experimental and has not yet been deified. It is being used by the Danish government to simulate the possible effects of pollution stemming from the oil exploration off Greenland and in studies of water flow where the Baltic meets the North Sea.

These last experiments are expected to be critical in determining the sort of water management necessary for the increasingly threatened Baltic.

Staff Shortage

CHI also has a System 3 at the research stage, which it is hoped will provide full three-dimensional modeling. Continued development work is hindered, however, by a shortage of suitably qualified staff and by the inadequacy of Neucc's mainframe, already stretched to the limits of its capacity of CHI's work.

Neucc is on the verge of inviting bids from minicomputer manufacturers for a $320,000 machine which will relive the 370/165 of some of the more routine work, but its English head, Dr. Michael Abbott, said "future developments on the software side depend on a corresponding hardware development."

By far the best known of CHI's existing system is System 21, which in 1974 and 1975 was used for hydraulic engineering on international projects.

"One of the main objectives for 1976 is to get ahead of these staffing difficulties," Abbott said. "Danish engineering salaries are probably the highest in Europe, but we need a high level of job security in our staff, so engineers are usually only employed by direct recommendation from their tutors and from other people well-known to the Danish Hydraulic Institute [DHI] management.

The '76 NCC Landmarks June 7-10

This is the year of landmarks at the National Computer Conference, June 7-10 in New York. The '76 NCC . . . during our Nation's Bicentennial . . . will explore the latest trends in computer science and technology, systems and applications, societal concerns, EDP management, and professional issues. And that's only the beginning. Other landmarks include the largest exhibit program ever held at an NCC, plus the 25th anniversaries of both the first Joint Computer Conference and the first commercially available electronic digital computer.

Register now for the world's most comprehensive computer conference. More than 100 information-packed sessions will cover 12 major areas including complex systems, architecture and hardware, software, computer communications and networking, applications, and education. And more than 275 organizations will display their latest computer products and services on three floors of the New York Coliseum.

Heading five plenary sessions will be a keynote address by J. Paul Lyet, Chairman and Chief Executive Officer of Sperry Rand Corporation. In addition, the NCC will feature a variety of special events and activities, including a unique networking demonstration and a Pioneer Day Program paying tribute to individuals from the Moore School of Electrical Engineering. And for an added fee, program registrants may also choose among a number of Professional Development Seminars.

Apply now for the *NCC Bicentennial Card* covering all four days of the conference, including exhibits. You'll save $15 on full-conference registration. Just fill in the coupon for advance registration, or to get all the facts on the '76 NCC.

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'76 NCC
Landmarks
in Data Processing

Burroughs Names Five Officers

DETROIT - Burroughs Corp. has elected five corporate vice-presidents.

Fred R. Meier was elected vice-president of product management. He is responsible for product development and marketing programs for the company's DP systems, terminals, peripherals and office equipment.

Paul R. Bunton was named vice-president of marketing administration.

George M. DuGan was elected vice-president and group executive of the Peripheral Products Group, which has worldwide responsibility for engineering and manufacturing peripheral equipment.

J. Roy Henry became vice-president and group executive of the Office Products Group, and George R. Johnson was elected vice-president, field engineering and marketing technical support.

SBS Gets Comsat Vice-President

WASHINGTON, D.C. - William D. English has been named vice-president and general counsel of Satellite Business Systems (SBS).

English was formerly vice-president and general counsel for Comsat General Corp., one of the three firms holding positions in SBS.

He is a member of the board of directors of Comsat General and will retain this position at least until approval of the SBS application by the Federal Communications Commission, an SBS spokesman said.

Other Moves

- Richard B. Sayford has been named vice-president of international marketing at Amdahl Corp.
- Gerald G. Probst, president of Univac, has been elected to the board of directors of The Girard Co. and Girard Bank.
- James N. Benson, formerly with Control Data Corp., has been elected vice-president of computer services at Commercial Credit Co.
- David J. Barber has resigned as vice-president of engineering and systems and as a director of Entrex, Inc. He was a founder of Entrex and also served briefly as president.

Executive Corner

- Dataproducts Corp. has appointed Robert F. Allen as vice-president of Austral-Asia and South American marketing.
- Kermit L. Stofer has been named executive vice-president of Computer Devices, Inc., and is responsible for marketing and corporate acquisitions.
- George J. Vasilakos has accepted appointment to vice-president, operations, for Southern Pacific Communications Co.

ITI Formed to Sell Equipment in N.E.

NEWTON, Mass. - Information Technology, Inc. (ITI) has been formed to act as representative for microform equipment and terminals in the New England area.

ITI is handling NCR's 260 thermal printer and the EMT-7, a 120 char./sec thermal printer, as well as NCR microform readers.

The founders, William G. Hogan and Leonard F. D'Innocenzo, were formerly associated with NCR.

Lessor Adds Service Unit

CHARLOTTE, N.C. – Analysis International Co., Inc. has formed an affiliate organization, Anico Data Services, Inc., to strenghen services to clients now being provided by Analysis International.

Anico Data Services will provide computer services, including programming and systems support, to various firms on a national scale.

Five-year-old Analysis International is engaged in the leasing of DP equipment.

ISD Broadens Line

SANTA CLARA, Calif. - Information Systems Design, Inc. (ISD), has established a Commercial Services Division to complement its engineering and scientific product lines.

Jay Rouse, vice-president of commercial services, said "our initial thrust will be in the financial planning and modeling area, where we have a proven product. Eventually, we will offer data base applications and further planning tools.

"Our goal is to complement existing computerized business systems by further analysis of the information that they produce."

ISD is a computer utility.

CDC Investigating Payments

MINNEAPOLIS Control Data Corp. disclosed its has uncovered "questionable" payments made by computer business subsidiaries and branches to foreign government officials and employees.

The firm estimated the total payments between 1973 and 1975, including commission payments irregularly accounted for, were about $2.28 million.

In addition to conducting an investigation to determine the nature and extent of payoffs throughout the corporation, the firm is initiating management training courses in trade practice laws.

"It appears that several members of senior management, including one who has been a director of the company for three years, had some degree of prior knowledge of, or generally authorized, one or more of the foreign payments," CDC said.

"There is no suggestion that any employee of Control Data or its subsidiaries profited personally," it added.

All payment arrangements of questionable legality have been ordered discontinued, except where such action might jeopardize assets, employee jobs or safety in a particular foreign country, the firm said.

CDC management believes neither the questionable payments nor the business associated therewith have been material in relation to computer business revenues, the firm said.

In a memo to employees, Chairman William C. Norris said, "I think it is time for U.S. government officials and businessmen to work together to find realistic solutions" to restructuring approaches to business in countries where payments to officials for contract approval is widespread..

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Contracts

SEL Receives Award From Westinghouse

FORT LAUDERDALE, Fla. – Systems Engineering Laboraties, Inc. (SEL) has received a three-year contract from Westinghouse Electric Corp. to supply 32-bit computers for use in its industrial systems applied in the control of utility management systems.

The contract with SEL, valued at up to $10 million, replaced an agreement Westinghouse had with Xerox Corp.

SEL has also been awarded a contract valued at more than $2 million from the Air Force's Electronic Systems Division to furnish, install and maintain three ground support computer systems.

Other Awards

Systems & Computer Technology Corp. has received a $10 million, six-year extension of its facilities management contract from the University of Miami in Coral Gables, Fla.

Datasaab Systems, Inc. has received a $2.5 million contract from Swedish Rail to supply 160 document terminals for transport reporting and administration of goods traffic.

Incoterm Corp. has received a $2.3 million contract from Vaxjo Data System, Sweden, for intelligent terminals, peripherals and software.

Cambridge Memories, Inc. has been awarded a contract from the U.S. Postal Service to provide a total of 3M bytes of add-on memory for use on the service's IBM 370/158 computer systems.

The Data Corp., a subsidiary of INA Corp., has been awarded a contract from Hay Associates to provide remote computer services to Hay's headquarters group.

Electronic Communications, Inc. has been awarded a $3.7 million contract from the Air Force Electronic Systems Division for communication printers at Strategic Air Command locations.

Health Application Systems, Inc., a subsidiary of Bergen Brunswig Corp., has received a contract from the Department of Defense (DOD) to act as a fiscal agent for DOD to process and pay all claims for health benefits under the Champus program in five states.

Varisystems Corp. has received a contract from Dymo Graphic Systems, Inc. to supply CRT stand-alone editing terminal components.

Rapidata, Inc. has been awarded a contract by the Federal Judicial Center for software, time-sharing and facilities management services.

The Federal Home Loan Bank of Chicago and Continental Illinois National Bank & Trust Co. said they plan to develop a shared electronic funds transfer network.

Emtec Engineering, Inc. has been awarded a contract from the International Telecommunications Satellite Organization (Intersat) for computer software for rain depolarization studies.

Marconi Space and Defense Systems of England has been awarded a contract from Intelsat for the development of lightweight filter technology.

Computronics, Inc. has received a contract from American Foundation Life Insurance Co. to perform DP services through the Totally Integrated Insurance Processing System.

Action Data Services has been awarded a five-year contract from ISC Financial House for the on-line processing of customer loan information.

New Registrations

INTEL CORP., 2065 Bowers Ave., Santa Clara, Calif. 95051, a semiconductor firm, filed to register 158,001 shares of capital, which may be offered in exchange for units of limited partnership interest of one or more open-end diversified investment company exchange funds or sold through brokers in the over-the-counter market at current prices at the time of sale. No underwriters are involved.

APPLIED DIGITAL DATA SYSTEMS, INC., 100 Marcus Blvd., Hauppauge, N.Y. 11787, a video display firm, filed to register warrants to purchase 25,000 shares of common at a purchase price of $12 per share (or any shares of common issue upon exercise of the warrant), to be offered for sale by certain warrant holders. No underwriter is involved.

COMPUGRAPHIC CORP., 80 Industrial Way, Wilmington, Mass. 01887, a maker of photocomposition equipment, filed to register 535,000 shares of common. Underwriters are headed by Kidder, Peabody & Co., Inc., 1251 Avenue of the Americas, New York, N.Y. 10020.

FOUR-PHASE SYSTEMS, INC., 19333 Wallco Parkway, Cupertino, Calif. 95014, a manufacturer of video display-oriented computers for distributed processing, filed to register a recapitalization involving $14 million of outstanding convertible subordinated notes, due 1983, and shares of senior convertible income voting preferred, and 4.7 million shares of common issuable upon conversion thereof. The recapitalization and conversion will occur during a special conversion period, when holders may elect to convert their securities. No underwriters are involved.

PRECISION INSTRUMENT CO., 2323 Owen St., Santa Clara, Calif. 95051, a mass memory systems firm, filed to register 1.5 million shares of common, to be offered for sale in order of priority to shareholders of the company (except current investors), vendors and/or suppliers of the company, employees of the company and other interested persons. The company will underwrite the offering.

Expansions

Orbis Systems, Inc. has moved into its 25,000 sq-ft facility at 14251 Franklin Ave., Tustin, Calif.

Digital Equipment Corp. will double the size of its Canadian headquarters in Kanata, near Ottawa, Ont., beginning this month.

DP Services, Inc. has moved into larger headquarter facilities at the Bullard Executive Center, 10051 Fifth St. N., St. Petersburg, Fla.

Warrex Computer Corp. moved into larger quarters at 12505 N. Central Expressway, Dallas, Texas.

Capac, Inc. is tripling its administration and production space in Ridgefield, Conn.

Applied Digital Systems, Inc. has begun construction on a 60,000 sq-ft addition scheduled for completion by Aug. 1.

Pertec Corp. has added 50,000 sq-ft to its Chatsworth, Calif., facility.

POSITION ANNOUNCEMENTS

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Boston area mfr expanding due to continued growth seeks highly motivated technician w/solid COBOL programm'g bkgd & ability to deal effectively with user mgmt. Exp in order entry, acctg, inventory, marketing or mfg systems helpful. Salary to $18K (fee paid). Contact Bill Grady (in confidence).

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INTERNAL CNSLNT-Wash. D.C.-SYS 3 or other mini exp + MS engrng/Computer sci $23-25M

PROJ LEADER NYC-check process/BTAM, ALP, BAL exp OS environment $25M+

SYST ANAL CONN-manuf syst prod. control PICS 360 DOS $23M

PROJ LEADER NYC-Fortune co seeks pay II implementation exp deg nec $23M

CORP SYST ANAL NYC-ins acctg system 370 VS. European trvl, knowl of foreign lang. helpful. $23M

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position announcements

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- Proficient in COBOL
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- Experienced in Manufacturing related applications

Experience in the following areas would also be very beneficial:

- IBM DOS/VS or OS/VS1
- BOMP, DBOMP, DL1
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Send resumes in strict confidence to:

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HOSPITAL COMPUTER SYSTEMS SPECIALIST

We require an individual to coordinate computer systems development for the member hospitals of a province-wide shared data processing service. This systems specialist will study and assess the feasibility of all new hospital computer applications, making appropriate recommendations as to their development and implementation.

As a liaison between the service organization and the hospitals, the ability to communicate effectively with senior people is very important. This position will appeal to the systems specialist who has strong analytical capability and is anxious to break new ground in the area of hospital/medical computer applications.

An attractive fringe benefit program is offered. We invite applications from qualified persons who are looking for a challenge and who would enjoy the scenic and refreshing atmosphere of New Brunswick.

Please send complete resume including salary requirements to:

Mr. V. J. Shipley, Director
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We are seeking a Systems Analyst to administer and assist in the development of a personnel/payroll/benefit computer system. Preferred candidate will posses a Bachelors Degree emphasizing finance or accounting disciplines and a minimum of 3 years of data processing experience which includes exposure to medium and large sized disc based systems using COBOL and Mark IV.

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The City of Lake Charles Administration is seeking a person with at least three years experience preferably in Municipal Data Processing and knowledge of latest data processing techniques and methodology. This person will, initially, assume total responsibility for interfacing between the administrative departments and the present Facilities Management System. He/she will also plan, develop, install and head an in-house data processing department in due course. The long range plans call for establishing an Information Management System for the City, with adequate supporting hardware.

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IBM 370/158 OS/SVS/HASP

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Computer Hardware Inc. has open positions for programmers and system analysts. Applicants must have a combination of two to three years experience in systems design and programming using ANSI-COBOL, FORTRAN IV or RPG II. 4 year college degree preferred. On-line, telecommunications, time-sharing and database management experience highly desirable. Write to:

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$24,000 plus liberal fringe benefit. Please send resume; references will be requested. Reply E.R. Krueger, OSSHE, Office of Educational Systems, P.O. Box 3175, Eugene, Oregon 97403. Applications accepted up to postmark date May 15, 1976. Equal Opportunity Employer.

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Applicants must have five years data processing experience with a systems engineering/programming background and be proficient in Assembly language. In-depth knowledge of S/370 architecture and teleprocessing, VM/CMS or ANS COBOL is desirable. A BS in math or computer science is preferred. Knowledge of the FDS system, Burroughs software, or VS1 is a plus.

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DIRECTOR OF SYSTEMS AND OPERATIONS

For Computer Network

The New Jersey Educational Computer Network (NJECN) is a cooperative organization of institutions of higher education providing academic and administrative computing services with an annual budget of approximately three million. Batch and interactive services are provided through purchased IBM 370/168 and 370/158 hardware.

The Director of Systems and Operations is directly responsible to the Network Executive Director for production operations, systems programming, technical support and overall management of the Systems and Operations area of the Network. The position requires a BS degree plus five years of experience in computer systems and operations, with at least two years of this experience at the senior managerial level in higher education computing. Applicant must exhibit leadership, solid management techniques and be technically qualified in all areas of computer systems and operations. Salary $22-25,000, plus excellent benefits.

Offices of the Corporation are located at Rutgers University in New Brunswick. Applications and resumes, including names of three professional references, should be sent to:

Dr. Joseph R. Denk
Executive Director
N.J. Educational Computer Network, Inc.
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The State University of New York at Binghamton is seeking an Assistant Director for Academic Services at the campus computer center. This position reports to the Director of the Center and is responsible for the overall planning, leadership, and coordination of academic computer service on campus. The SUNY-Binghamton computer center provides services based on an IBM 370/158 to a progressive and interested academic community. Applications range from the teaching of computer technology to involvement in research in the humanities, social sciences, and management.

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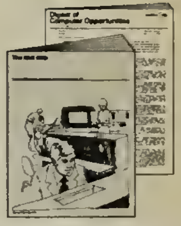

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South & Southwest: Atlanta (404/634-5127), Dallas (214/638-4080), Houston (713/626-8705), New Orleans (504/523-2576).

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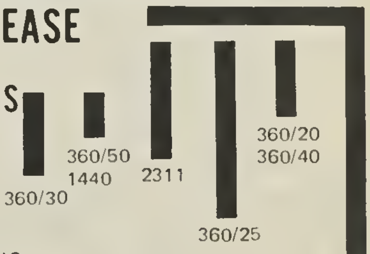

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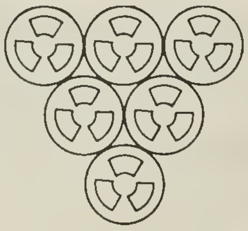

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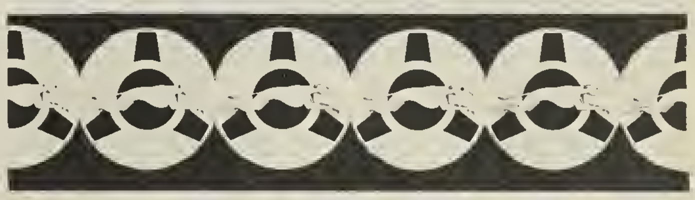

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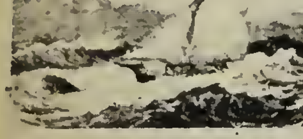

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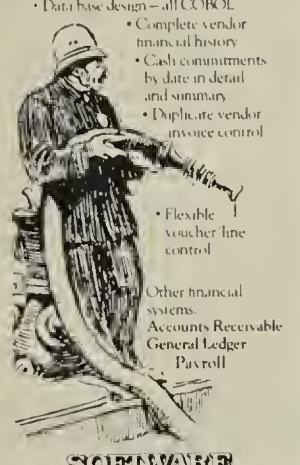

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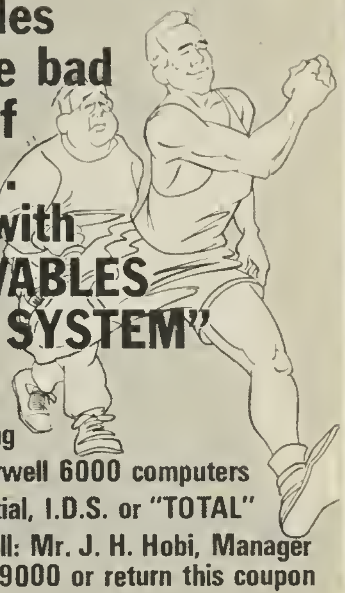

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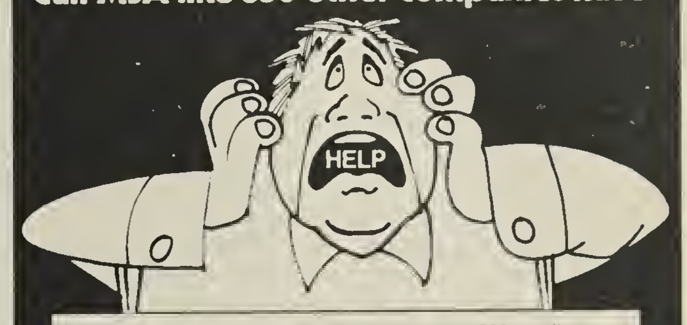

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SEC Changes Reporting Rules

WASHINGTON, D.C. – Large nonfinancial corporations will be required to disclose to the Securities and Exchange Commission (SEC) the cost of replacing inventories and productive plants at current prices for fiscal years ending on or after Dec. 25.

The requirements, issued by the SEC, also demand an indication of what these firms' depreciation and cost of sales would be if computed using replacement costs. Companies must also disclose how they compute the replacement cost figures.

The move, intended to focus on the impact of inflation on the largest firms in the U.S., will probably be expanded to include smaller firms in the future, observers said. It is expected to initially cover the 1,000 largest firms.

The disclosures will be required by corporations whose inventory, property, plant and equipment before depreciation charges exceed $100 million and make up more than 10% of total assets.

The new method of stating costs represents a step away from listing assets at original or "historical" cost and toward using current values as a basis.

Two Mini Makers Show Half-Year Gains

Data General Corp. (DG) earnings continued to climb in the second quarter and six months while Microdata Corp.'s earnings rose 203% in the second quarter.

DG showed second-quarter earnings of $4 million or 42 cents a share compared with $2.9 million or 35 cents a share in the same period last year.

Revenues climbed to $34.1 million compared with $24.6 million in the same 1975 period.

For the six months, DG earnings rose to $7.5 million or 79 cents a share compared with $5.7 million or 70 cents a share in the 1975 half-year.

Revenues totaled $63.1 million compared with nearly $48.8 million in the year-ago period.

At Microdata, the second quarter ended Feb. 29 with earnings totaling $587,471 or 34 cents a share compared with $193,664 or 12 cents a share in the same period last year.

Revenues nearly doubled, to $6.3 million compared with $3.4 million.

For the six months, the Irvine, Calif.-based firm compiled earnings of over $1 million or 59 cents a share compared with nearly $46,000 or 3 cents a share in the 1975 period.

Revenues climbed to $11.2 million compared with $6.9 million in the 1975 half.

Microdata President Donald W. Fuller said the firm successfully completed its recent public offering of 500,000 shares of common with net proceeds to the company of about $9 million.

CIG Moves Into the Black

STAMFORD, Conn. – Computer Investors Group, Inc. (CIG) showed earnings in both the third quarter and nine months compared with losses in the year-ago periods.

Results of the 1974 periods were restated to reflect a change in accounting for foreign currency translation gains and losses.

During the nine months ended Dec. 31, the firm earned $2.1 million or 95 cents a share compared with a loss of $1.9 million or 88 cents a share in the same period last year.

Revenues edged up slightly to almost $22.3 million compared with nearly $22.2 million a year ago.

Quarter Improves

During the quarter, CIG earned $994,239 or 46 cents a share compared with a loss of $759,033 or 35 cents a share in the year-ago period.

Revenues totaled $7.9 million compared with almost $7.7 million.

The 1975 results include foreign currency translation gains of $4 million for the nine months and $1.3 million for the quarter. These gains may not necessarily be indicative of the gain or loss for the entire year, the firm observed.

The 1974 results were restated and currency losses totaled $1.01 million in the nine months and $336,590 for the quarter.

CMI Loses in First Half Despite Upswing

BEDORD, Mass. – Cambridge Memories, Inc. (CMI) turned in a profitable second quarter, but the results were not enough to counterbalance the first-quarter loss.

During the second quarter, ended Feb. 28, the firm earned $54,000 or 3 cents a share compared with $46,000 or 3 cents a share in the same period last year.

Revenues totaled nearly $6.9 million compared with $5.2 million in the year-ago period.

Sales volume during the quarter was $2.1 million greater than the preceding first quarter this year, the firm said.

For the six months, CMI lost $604,000 or 36 cents a share compared with earnings of $148,000 or 9 cents a share in the same 1975 period.

Revenues for the half rose to $11.6 million compared with $10.9 million in the year-ago period.

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Saul Stimler is President of Stimler Associates. He is a 16-year veteran in data communications and data processing. He has provided in-house training, specification preparation, design, evaluation, performance improvement, system planning, benchmarking and project management consulting services for leading companies and government agencies in the United States and Canada. Mr. Stimler is the author of the highly acclaimed book, *Data Processing Systems - Their performance, evaluation, measurement and improvement*, and this book will be an important part of the course materials. Advance copies are available - see the coupon below.

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Earnings Reports

MOSTEK
Year Ended Dec. 31

	1975	1974
Shr Ernd	.....	$.98
Revenue	$47,118,659	60,059,701
Earnings	(1,238,380)	3,894,222
3 Mo Shr	.02	.05
Revenue	13,722,616	16,569,942
Earnings	62,126	220,731

TECHNITROL
Year Ended Dec. 31

	1975	1974
Shr Ernd	$.60	$.39
Revenue	16,142,529	16,182,798
Earnings	789,744	521,272
3 Mo Shr	.11	.08
Revenue	3,732,514	4,075,268
Earnings	135,721	96,850

BUNKER RAMO
Year Ended Dec. 31

	1975 (000)	1974 (000)
Shr Ernd	.....	$.09
Revenue	$289,058	314,017
Earnings	b(13,844)	3,226
3 Mo Rev	70,585	75,301
Loss	b11,947	1,248

a-Restated to reflect accounting change for translation of foreign currency. b-Includes $7 million pretax provision for asset writedowns and other associated costs and expenses of Esis discontinuance.

SANDERS ASSOCIATES
Three Months Ended Jan. 23

	1976	1975
Shr Ernd	$.33	$.14
Revenue	49,526,000	41,015,000
Tax Cred	455,000	162,000
Earnings	1,518,000	675,000
6 Mo Shr	.53	.24
Revenue	98,844,000	80,397,000
Tax Cred	730,000	266,000
Earnings	2,433,000	1,109,000

SYCOR
Year Ended Dec. 31

	1975	1974
Shr Ernd	$2.25	$1.82
Revenue	54,829,000	40,141,000
Tax Cred	1,310,000	1,824,000
Earnings	6,408,000	5,071,000
3 Mo Shr	.68	.49
Revenue	15,208,000	10,674,000
Tax Cred	313,000	375,000
Earnings	1,957,000	1,376,000

TRACOR
Year Ended Dec. 31

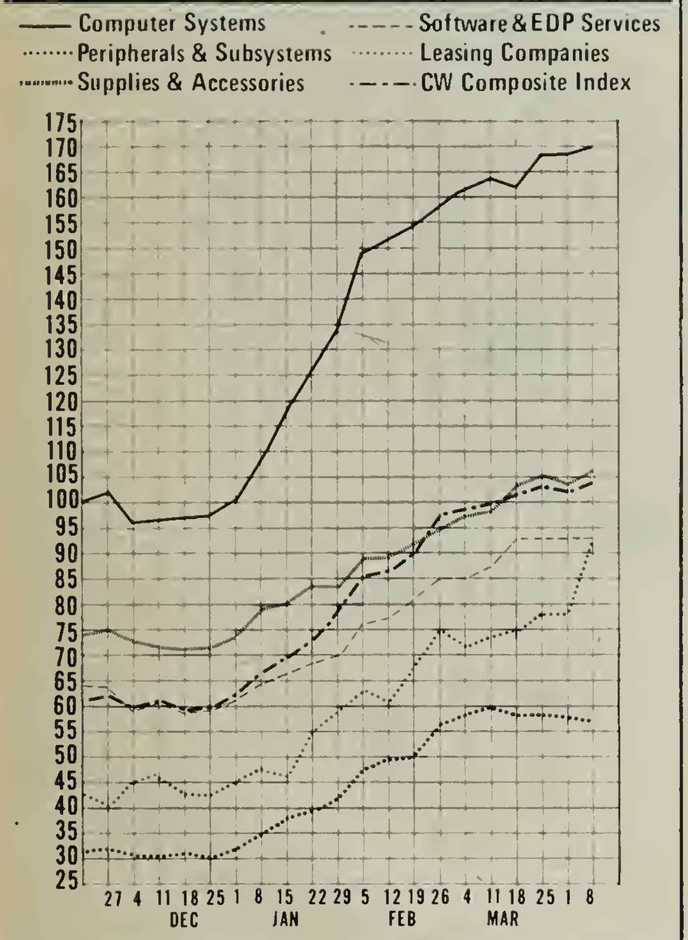
	1975	1974
Shr Ernd	$2.28	$.75
Revenue	103,729,000	94,368,000
Disc Op	.....	(1,490,000)
Tax Cred	2,790,000	1,083,000
Earnings	5,623,000	1,831,000
3 Mo Shr	.63	.24
Revenue	27,986,000	25,680,000
Disc Op	.....	(494,000)
Tax Cred	765,000	481,000
Earnings	1,555,000	577,000

MEASUREX
Year Ended Nov. 30

	1975	1974
Shr Ernd	$1.20	$1.31
Revenue	53,785,000	42,086,000
Earnings	3,899,000	3,965,000
3 Mo Shr	.31	a.30
Revenue	12,644,000	13,187,000
Earnings	1,007,000	a981,000

a-Restated.

COMPUTERWORLD Computer Stocks Trading Indexes



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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, APRIL 7, 1976

All statistics compiled, computed and formatted by
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COMPUTER SYSTEMS

EXCH		PRICE			
		1975-76 RANGE (1)	CLOSE APR 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	62-109	104 1/4	+1 1/2	+1.4
O	COMPUTER AUTOMATION	2- 19	18	+ 5/8	+3.5
N	CONTROL DATA CORP	11- 27	25 1/2	+ 1/4	+0.9
N	DATA GENERAL CORP	10- 60	58 1/4	+3 3/8	+6.1
C	DATAPOINT CORP	6- 39	38 1/4	+2	+5.5
C	DIGITAL COMP CONTROL	1- 4	3 1/2	+ 1/4	+7.6
N	DIGITAL EQUIPMENT	46-181	176 3/4	+1 1/4	+0.7
N	ELECTRONIC ASSOC.	2- 5	4	0	0.0
A	ELECTRONIC ENGINEER.	5- 16	15	+ 3/8	+2.5
N	FOXBORO	23- 42	37 1/8	+ 1/2	+1.3
O	GENERAL AUTOMATION	4- 14	10 3/8	+ 5/8	+6.4
C	GRI COMPUTER CORP	1- 1	3/4	- 1/8	-14.2
N	HEWLETT-PACKARD CO	58-120	114 7/8	- 5/8	-0.5
N	HONEYWELL INC	22- 56	47 5/8	- 7/8	-1.8
N	IBM	158-272	269	+7	+2.6
C	MANAGEMENT ASSIST	1- 3	2 7/8	+ 1/2	+21.0
O	MEMOREX	1- 26	25	0	0.0
O	MICRODATA CORP	2- 26	24 1/2	+ 3/4	+3.1
C	MODULAR COMPUTER SYS	5- 19	10 1/4	- 1/2	-4.6
N	NCR	15- 39	26 7/8	- 3/4	-2.7
O	PRIME COMPUTER INC	2- 11	10 1/4	+ 1/2	+5.1
N	PERKIN-ELMER	16- 30	26 1/8	+ 1/2	+1.9
N	RAYTHEON CO	26- 59	53 1/2	+1 1/4	+2.3
N	SPERRY RAND	26- 50	48 3/8	- 1/2	-1.0
O	SYCOR INC	5- 31	27 1/2	+ 1/4	+0.9
A	SYSTEMS ENG. LABS	1- 10	8 1/4	- 7/8	-9.5
N	VARIAN ASSOCIATES	7- 18	14 1/2	-1 1/8	-7.1
N	WANG LABS.	7- 20	18 1/4	+ 1/4	+1.3

LEASING COMPANIES

EXCH		1975-76 RANGE (1)	CLOSE APR 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	1- 10	8 1/2	-1 1/4	-12.8
A	COMMERCE GROUP CORP	2- 4	3 1/8	0	0.0
A	COMPUTER INVSTRS GRP	1- 3	2 1/8	0	0.0
M	DATRONIC RENTAL	1- 1	5/8	0	0.0
A	DCL INC	0- 1	3/4	0	0.0
N	DPF INC	3- 7	6	- 3/4	-11.1
O	EDP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/2	0	0.0
A	GREYHOUND COMPUTER	2- 5	4 1/2	+ 1/4	+5.8
N	ITEL	3- 13	12 1/2	+1 1/8	+9.8
N	LEASCO CORP	4- 14	12 3/4	+ 5/8	+5.1
O	LEASPAC CORP	0- 1	1/4	0	0.0
C	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NRG INC	0- 4	1	+ 3/4	+300.0
A	PIONEER TEX CORP	2- 9	7 1/2	0	0.0
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	10 5/8	- 1/4	-2.2

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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SOFTWARE & EDP SERVICES

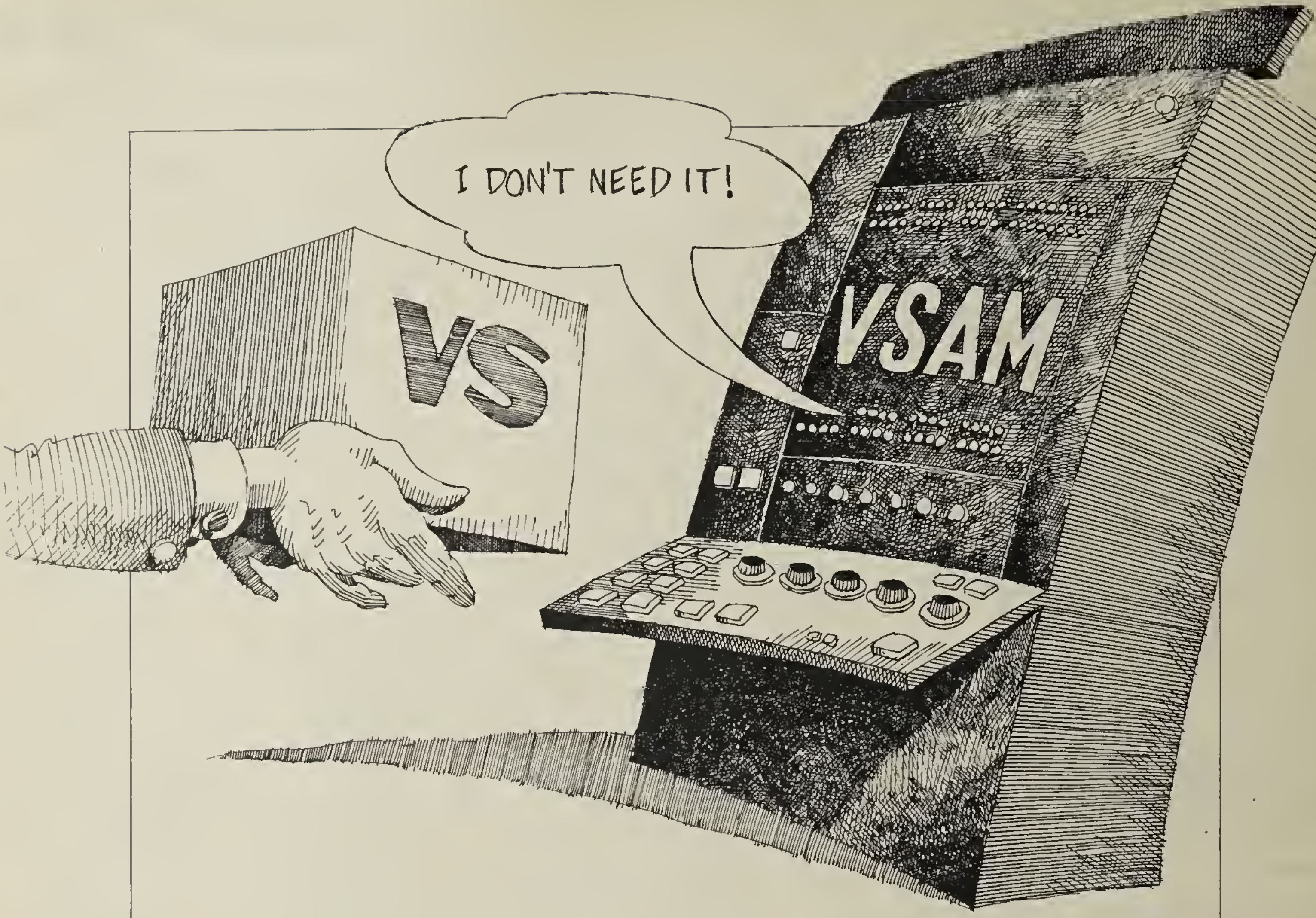
EXCH		1975-76 RANGE (1)	CLOSE APR 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 1	3/4	0	0.0
A	APPLIED DATA RES.	1- 10	2 5/8	+ 1/8	+5.0
N	AUTOMATIC DATA PROC	29- 65	63 1/2	+ 1/2	+0.7
O	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
O	COLEMAN AMERICAN COS	4- 6	4 1/8	- 1/8	-2.9
C	COMPUTER DIMENSIONS	2- 7	6 3/8	+1 1/8	+21.4
O	COMP ELECTION SYSTMS	3- 7	5 3/4	0	0.0
C	COMPUTER HORIZONS	1- 1	1 3/4	0	0.0
O	COMPUTER NETWORK	1- 6	5 3/4	+2 1/8	+58.6
N	COMPUTER SCIENCES	2- 8	6 7/8	0	0.0
C	COMPUTER TASK GROUP	1- 1	1 1/8	0	0.0
O	COMPUTER USAGE	2- 6	4 1/2	- 1/2	-10.0
C	COMSHARE	2- 4	3 5/8	- 3/8	-9.3
O	DATATAB	1- 2	1	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 28	12 3/4	- 1/8	-0.9
C	INFONATIONAL INC	1- 1	1/8	- 1/8	-50.0
C	IPS COMPUTER MARKET.	1- 1	1 1/4	0	0.0
O	KEANE ASSOCIATES	2- 3	3 1/8	+ 1/8	+4.1
C	KEYDATA CORP	2- 5	3 1/4	0	0.0
O	LOGICON	3- 5	4	0	0.0
A	MANAGEMENT DATA	1- 3	2 5/8	0	0.0
A	NATIONAL CSS INC	6- 25	21 5/8	+ 3/8	+1.7
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 22	19 7/8	- 1/4	-1.2
N	PLANNING RESEARCH	2- 6	3 3/4	0	0.0
C	PROGRAMMING & SYS	1- 1	1/2	0	0.0
O	RAPIDATA INC	2- 5	3 5/8	- 1/2	-12.1
O	REYNOLDS & REYNOLD	10- 24	17 1/2	- 1/2	-2.7
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1	0	0.0
C	TYMSHARE INC	7- 28	24 7/8	-1 7/8	-7.0
A	URS SYSTEMS	2- 5	4	- 1/8	-3.0
N	WYLY CORP	2- 7	4 3/4	- 1/8	-2.5

PERIPHERALS & SUBSYSTEMS

EXCH		1975-76 RANGE (1)	CLOSE APR 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	4- 13	10 1/4	+ 5/8	+6.4
O	ADVANCED MEMORY SYS	1- 10	8 3/4	- 1/4	-2.7
N	AMPEX CORP	3- 8	7 1/2	- 1/8	-1.6
O	ANDERSON JACOBSON	1- 4	2 7/8	- 1/8	-4.1
O	BEEHIVE MEDICAL ELEC	1- 6	5 1/8	- 1/4	-4.6
A	BOLT,BERANEK & NEW	5- 13	8 1/8	- 1/4	-2.9
N	BUNKER-RAMO	4- 8	6 1/8	- 3/8	-5.7
A	CALCOMP	3- 7	5 1/2	0	0.0
O	CAMBRIDGE MEMORIES	1- 6	5 1/4	0	0.0
N	CENTRONICS DATA COMP	7- 35	31 3/8	+3 5/8	+13.0
C	CODEX CORP	15- 42	37	- 1/2	-1.3
C	COGNITRONICS	1- 2	1 1/8	0	0.0
C	COMPUTER COMMUN.	1- 3	4 1/4	0	0.0
O	COMPUTER CONSOLES	3- 7	5 3/4	- 1/4	-4.1
A	COMPUTER EQUIPMENT	1- 3	2 1/8	+ 1/8	+6.2
C	COMPUTER MACHINERY	1- 2	2	0	0.0
O	COMPUTER TRANSCEIVER	0- 0	1 1/2	- 1/8	-7.6
C	COMTEN	2- 9	7 3/4	0	0.0
N	CONRAC CORP	12- 30	23 1/4	- 5/8	-2.6
O	DATA ACCESS SYSTEMS	1- 3	2	+ 5/8	+45.4
O	DATA 100	5- 16	12 1/2	+ 1/2	+4.1
A	DATA PRODUCTS CORP	2- 11	10 1/8	+ 3/8	+3.8
O	DATA TECHNOLOGY	1- 3	2	0	0.0
O	DATUM INC	1- 2	2 1/8	- 1/8	-5.5
O	DECISION DATA COMPUT	2- 7	2 1/2	- 1/2	-16.6
O	DELTA DATA SYSTEMS	1- 1	3/8	+ 1/8	+50.0
C	DI/AN CONTROLS	1- 1	1	0	0.0
N	ELECTRONIC M & M	1- 3	2 7/8	- 1/8	-4.1
O	FABRI-TEK	1- 1	1	0	0.0
O	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	3- 12	10 1/2	+ 1/8	+1.2
N	HARRIS CORP	18- 47	43 5/8	-2 1/8	-4.6
A	INCOTERM CORP	3- 20	16 3/4	- 3/4	-4.2
O	INFOREX INC	2- 7	6 1/8	- 1/8	-2.0
O	INFORMATION INTL INC	8- 18	15 3/4	+ 5/8	+4.1
O	INTEL CORP	21-109	100 1/2	-8 1/2	-7.7
A	LUNDY ELECTRONICS	3- 7	5	- 1/8	-2.4
O	MSI DATA CORP	3- 10	6 3/4	- 1/4	-3.5
A	MILGO ELECTRONICS	8- 24	16 1/4	- 7/8	-5.1
N	MOHAWK DATA SCI	1- 7	5 3/8	- 1/4	-4.4
C	OPTICAL SCANNING	1- 3	3/8	0	0.0
O	PENRIL CORP	0- 0	2 3/4	+ 1/4	+10.0
A	PERTEC CORP	2- 8	7	+ 5/8	+9.8
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	3/4	0	0.0
O	QUANTOR CORP	2- 6	4 1/8	0	0.0
O	RECOGNITION EQUIP	2- 11	10 1/8	+ 1/2	+5.1
N	SANDERS ASSOCIATES	3- 11	10 1/2	+ 3/4	+7.6
C	SCAN DATA	1- 4	2 3/8	- 3/8	-13.6
C	STORAGE TECHNOLOGY	6- 17	10 5/8	- 7/8	-7.6
O	T BAR INC	3- 10	6 1/4	- 1/2	-7.4
O	TALLY CORP.	1- 6	5	- 1/8	-2.4
O	TEC INC	1- 5	4 3/4	0	0.0
N	TEKTRONIX INC	18- 60	58 3/4	-1 1/4	-2.0
N	TELEX	1- 5	4	- 1/4	-5.8
O	WANGCO INC	4- 22	20 3/4	+ 3/4	+3.7
O	WILTEK INC	1- 4	2	0	0.0

SUPPLIES & ACCESSORIES

EXCH		1975-76 RANGE (1)	CLOSE APR 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 3	3 3/8	+ 1/8	+3.8
O	BALTIMORE BUS FORMS	4- 5	4 1/2	- 1/4	-5.2
A	BARRY WRIGHT	5- 10	8 7/8	+ 1/8	+1.4
O	CYBERMATICS INC	0- 1	3/4	+ 1/8	+20.0
A	DATA DOCUMENTS	29- 42	37	- 7/8	-2.3
O	DUPLEX PRODUCTS INC	12- 25	20	+1 1/2	+8.1
N	ENNIS BUS. FORMS	5- 8	6 5/8	- 1/8	-1.8
C	GRAHAM MAGNETICS	5- 13	11	+ 1/4	+2.3
C	GRAPHIC CONTROLS	8- 21	17 1/4	- 1/4	-1.4
N	3M COMPANY	43- 68	63 1/4	- 7/8	-1.3
C	MOORE CORP LTD	39- 51	49	+ 1/2	+1.0
N	NASHUA CORP	9- 22	14 1/2	+1 3/8	+10.4
O	STANDARD REGISTER	11- 20	17 1/4	-1	-5.4
O	TAB PRODUCTS CO	4- 8	6 1/2	0	0.0
N	UARCO	17- 25	25	+ 3/8	+1.5
C	VANIER GRAPHICS CORP	4- 8	7 3/8	0	0.0
A	WABASH MAGNETICS	3- 8	7 1/8	+ 1/8	+1.7
N	WALLACE BUS FORMS	15- 25	22 1/2	+ 5/8	+2.8



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